ERAGROSTIS (POACEAE: CHLORIDOIDEAE: ERAGROSTIDEAE: ERAGROSTIDINAE) FROM NORTHEASTERN MÉXICO

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ABSTRACT

A taxonomic treatment of *Eragrostis* Wolf for northeastern México (Coahuila, Nuevo León, and Tamaulipas), is given. Twenty-six species and four varieties or subspecies of *Eragrostis* are recognized in the study area. Twenty of these species are native to the Flora region and six are introduced and adventive. Keys for determining the species, descriptions, distributions, specimens examined, illustrations, synonymies, and a brief discussion indicating relationships among all native and adventive species of *Eragrostis* in northeastern México are provided.

RESUMEN

Se presenta un estudio taxonómico de *Eragrostis* Wolf para el noreste de México (Coahuila, Nuevo León y Tamaulipas). Un total de veintiséis especies y cuatro variedades o subespecies de *Eragrostis* se reconocen en el área del estudio. Veinte de estas especies son nativas de la flora de la región y seis son introducidas y adventicias. Se incluyen claves para determinar las especies, descripciones, distribuciones, especimenes examinados, ilustraciones, sinonimias, y una discusión breve indicando las relaciones entre todas las especies nativas y adventicias de *Eragrostis* para el noreste de México.

Coahuila, Nuevo León, and Tamaulipas or northeastern México covers an area of 291,955 km^2 or 15 % of the total land of México. This area includes portions of two natural regions known as the Chihuahuan and Tamaulipan Deserts. These regions are considered a center of origin and diversification of arid and semi-arid plant species (Dávila-Aranda et al. 2004; Peterson et al. 2005). As part of the current revision of the grass flora of northeastern México, an examination of the taxonomy and distribution of the species of *Eragrostis* was begun to aid the agriculture and livestock industries. This study treats 26 species and four varieties or subspecies, for a total of 30 taxa.

Eragrostis is a large genus of more than 350 species occurring in tropical, subtropical, and warm temperate regions throughout the World (Clayton & Renvoize 1986; Peterson et al. 1995, 1997, 2001; Watson & Dallwitz 1992). There are 111 species of *Eragrostis* found in North, Central, and South America; 25 native in the United States and Canada; and 36 native in México (Beetle et al. 1991; Espejo-Serna et al. 2000; Peterson et al. 2001, 2003, 2005). The genus is charac-

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terized by having many-flowered spikelets where the disarticulation of the lemma and palea occurs separately, lemmas that are usually 3-nerved and unawned, longitudinally bowed-out paleas with ciliolate keels, paniculate inflorescences, and leaves with ciliate ligules (Peterson et al. 1997). Most species of *Eragrostis* occupy open habitats with poor soils and many occur in disturbed localities (Clayton & Renvoize 1986; Van den Borre & Watson 1994).

All species of *Eragrostis* that have been examined anatomically exhibit "kranz" or C_4 leaf anatomy [except the C_3, *E. walteri* Pilg from South Africa, see Ellis (1984)] and species have either chloridoid bicellular microhairs (broad, short terminal cell the same thickness as the basal cell) or panicoid bicellular microhairs-like (long, thin-walled terminal cell) [Amarasinghe & Watson 1990]. Apparently three C_4 biochemical types exist in *Eragrostis*: NAD-ME (nicotinamide adenine dinucleotide co-factor malic enzyme), PCK (phosphoenolpyruvate carboxykinase), and intermediates (Prendergast et al. 1986).

The classification of the tribe Eragrostideae has been problematic, primarily because no one has been able to define this group and select diagnostic characters that exclusively delimit this tribe from other tribes in the Chloridoideae (Hilu & Alice 2000; 2001; Van den Borre & Watson 1997; 2000). Historic accounts of the ever changing opinions of systematists on the classification of the Eragrostideae can be found in Peterson et al. (1995) and Van den Borre and Watson (1994). Peterson et al. (1997) recognized 38 Eragrostideae genera occurring in the New World, then later placed many of these same genera in the tribe Cynodonteae without delineating an Eragrostideae. Based on results of a DNA sequence study of the Chloridoideae (Columbus et al. 2005), Peterson et al. (2005) has proposed a completely new classification of the New World Chloridoideae. Here, the Eragrostideae is narrowly interpreted to include only three small subtribes (Cotteneinae, Uniolinae, and the Eragrostidinae) that diverge as a clade at the base of the chloridoids (Peterson et al. 2005). Character trends in the Eragrostideae include spikelets with many florets, lemmas with 3–13-nerves, and many species adapted to xeric habitats.

The subtribe Eragrostidinae as treated here includes three genera: *Cladoraphis cyperoidcae* (Thunb.) S.M. Phillips introduced from Africa; *Eragrostis* with 112 species (86 native NW spp.); and *Steirachne* with two species (Peterson 2003; Peterson et al. 2005). The Eragrostidinae is characterized by having hairy or glabrous culm nodes; hairy or glabrous rachillas; entire lemma apices that are awnless, mucronate or short-awned (only in the latter two genera); glabrous or scabrous lemmas that are (1) 3 (5)-nerved lemmas; and short basal microhair cells (15–75 microns) on the abaxial epidermis of the leaf blade.

Recent systematic treatments of *Eragrostis* from Argentina (Nicora 1998), Australia (Lazarides 1997), Brazil (Boechat & Longhi-Wagner 2001), Ecuador (Peterson 2001), Mesoamerica (Davidse 1994), México (Beetle et al. 1991), the United States and Canada (Peterson 2003), and Zambesiaca (Cope 1998) have

given us a good understanding of the species limits and their distribution. Based on nuclear and plastid DNA sequences, Ingram and Doyle (2004, 2005) tested the monophyly of *Eragrostis* and found that with inclusion of *Acamptoclados* Nash (*E. sessilispica* Buckley), *Diandrochloa* de Winter, *Neeragrostis* Bush, and *Pogonarthria* Stapf the genus is indeed monophyletic. However, only 37 species of *Eragrostis* were included in their analysis so any subgeneric interpretations were beyond the scope of their work. What is lacking is a definitive treatment of the subgeneric classification of the entire genus. Based on spikelet disarticulation Clayton (1974) and Clayton and Renvoize (1986) have arrived at a "first approximation to natural groups" and have presented a key to sections *Psilantha*, *Eragrostis*, *Lappula*, and *Platystachya*. In most native New World species the lemmas fall acropetally (from the base towards the apex) from the persistent rachilla, and with the paleas persistent on the rachilla. The other major pattern of spikelet disarticulation in *Eragrostis* is when the lemmas fall basipetally (from the apex towards the base). Van den Borre and Watson (1994) investigated 53 species of *Eragrostis* and found that anatomical characters, among others, support the recognition of two distinct groups: subgenus *Eragrostis* and subg. *Caesiae*. The most comprehensive attempt so far is Lazarides (1997) treatment of the Australian *Eragrostis* where he recognized six groups primarily based on spikelet disarticulation. Lazarides (1997) correlates his classification with Van den Borre and Watson (1994) who recognized subgenus *Eragrostis* and subg. *Psilantha*, and with Amarasinghe and Watson (1990) who investigated microhair morphology within the genus. Cope's (1998) subgeneric treatment of *Eragrostis* for the flora of Zambesiaca is also comprehensive since he delineates nine groups based on panicle, lemma, and palea morphology in addition to spikelet disarticulation.

The following taxonomic treatment contains a key for determining the species, descriptions, distribution, specimens examined, illustrations, synonymies, and a brief discussion indicating hypothesized relationships among all native and adventive species of *Eragrostis* in northeastern México. This study is based on the examination of herbarium specimens from ANSM, COCA, MEXU, MO, TEX, UAT, and US, including the type specimens of most of the species studied.

TAXONOMIC TREATMENT

Eragrostis Wolf, Gen. Pl. 23. 1776. TYPE: *Eragrostis minor* Host (LECTOTYPE: designated by R. Ross, Acta Bot. Neerl. 15:157. 1966).

Plants annual or perennial; usually synoecious, sometimes dioecious; caespitose, stoloniferous, or rhizomatous. Flowering culms (2–)5–170 cm tall, not woody, erect, decumbent, or geniculate, sometimes rooting at the lower nodes, simple or branched; internodes solid or hollow; bud initiation intravaginal, rarely extravaginal. Leaf sheaths open, often with tufts of hairs at the apices, hairs 0.3–8 mm long; ligules usually membranous and ciliolate or ciliate, cilia sometimes longer than the membranous base, occasionally of hairs or membranous and

non-ciliate; blades flat, folded, or involute. Inflorescences terminal, sometimes also axillary, simple panicles, open to contracted or spike-like, terminal panicles usually exceeding the upper leaves; pulvini in the axils of the primary branches glabrous or hairy; branches not spike-like, not disarticulating. Spikelets 1–18(–23) mm long, 0.6–9 mm wide, laterally compressed, with 2–45 florets; disarticulation below the fertile florets, sometimes also below the glumes, acropetal with deciduous glumes and lemmas but persistent paleas, or basipetal with the glumes often persistent and the florets usually falling intact; glumes usually shorter than the adjacent lemmas, (1)3(5)-veined, not lobed, apices obtuse to acute, unawned; calluses glabrous or sparsely pubescent; lemmas usually glabrous, obtuse to acute, 3(5)-veined, usually keeled, unawned or mucronate; paleas shorter than the lemmas, longitudinally bowed-out by the caryopses, 2-keeled, keels usually ciliate, intercostal region membranous or hyaline; anthers 2 or 3; ovaries glabrous; styles free to the bases. Cleistogamous spikelets occasionally present, sometimes on the axillary panicles, sometimes on the terminal panicles. Caryopses variously shaped; hilum short; embryo with an epiblast, scutellar tail, and elongated mesocotyl internode (formula P+PF), endosperm hard. Base chromosome number, $x = 10$.

The origin of the name is somewhat obscure. Nathaniel Wolf (1776), who first named *Eragrostis*, made no statement concerning the origin of its name. Clifford (1996) provides three possible derivations: from eros, 'love', and *Agrostis*, the Greek name for an indeterminate herb; from the Greek er, 'early' and *agrostis*, 'wild', referring to the fact that some species of *Eragrostis* are early invaders of arable land; or the Greek eri–, a prefix meaning 'very' or 'much', suggesting that the name means many-flowered *Agrostis*. Watson and Dallwitz (2003) indicate that the derivation of *Eragrostis* is "from the Greek *cros* (love) or *era* (earth) and *agrostis* (a grass), probably alluding to the characteristic, earthy (human) female aroma of the inflorescences of many species."

Comments.—As taxonomists we know little about the true limits or boundaries among species of *Eragrostis* but hope our treatment using gross morphological features will allow determination of most of the 26 species. We also want to familiarize the user with the morphological features that are used to infer relationships among this group of grasses. Therefore, we present a review of the affinities or "hypothesized relationships" of the 26 species of *Eragrostis* from Northeastern México for readers to more thoroughly understand their classification and to point out problem areas that will require further analysis. The following four paragraphs outline our current thoughts on four hypothesized lineages within these 26 species of *Eragrostis*: the Old World group, *Eragrostis intermedia* complex, *E. pectinacea* complex, and *E. spectabilis-E. secundiflora* group.

The Old World group consists of *E. barrelieri*, *E. ciliaensis*, *E. curvula*, and *E. lehmanniana*. Based on acropetal floret disarticulation, persistent rachillas, deciduous lemmas, persistent paleas, and the presence of laterally compressed

spikelets, Lazarides (1997) placed: *E. barrelieri*, *E. cilianensis*, *E. curvula*, and *E. mexicana* in his"group 2." In addition to these species, Cope (1998) placed *Eragrostis lehmanniana* in his "group 9" which corresponds to sect. *Eragrostis*. It is also interesting to note that two (*E. curvula* and *E. lehmanniana*) of these five species have dorsally compressed caryopses while the others have laterally compressed caryopses. The only species native to the New World in this assemblage is *E. mexicana*, a weedy taxon naturalized in Australia and South Africa.

Preliminary DNA sequence evidence suggests that *E. mexicana* might be aligned with some members of the subsect. *Hirsutae* (Ingram & Doyle 2004) as proposed by Harvey (1948) and later investigated and expanded by Witherspoon (1975) as the "*Eragrostis intermedia* complex." Based on having wide, open panicles with spreading branches, disarticulating rachillas, and caryopses with surface reticulations, Witherspoon included the following species from the Flora region in the *E. intermedia* complex: *E. erosa*, *E. intermedia*, *E. hirsuta*, *E. hirta*, *E. lugens*, and *E. palmeri*. We feel the *Eragrostis intermedia* complex is a young assemblage of species that is rapidly evolving since the morphological limits among the species are small.

We feel that *E. mexicana* is perhaps better aligned with *E. pectinacea* and *E. pilosa* in the *E. pectinacea* complex as proposed by Harvey (1948) who emphasized the deeply-grooved ventral surface of the caryopses and the presence of glandular tissue below the nodes in his subsect. *Pectinaceae*. Harvey also included *E. tef* (Zucc.) Trotter, the economically important cereal crop grown primarily in Ethiopia, in the *Pectinaceae* group. Ingram and Doyle (2003) recently investigated the origin and evolution of *E. tef* and presented evidence that supports *E. pilosa* as a close relative and potential progenitor to the tef genome.

Based on the presence of stiffly spreading panicle branches and flattened, coriaceous spikelets that usually appear distant, Harvey (1948) recognized the following four species in subsect. *Spectabiles*: *E. curtipedicellata*, *E. elliottii*, *E. silveana*, and *E. spectabilis*. Three of these species (excluding *E. elliottii*) have short, knotty rhizomes. *Eragrostis secundiflora*, also with coriaceous spikelets, was placed by Harvey (1948) in subsect. *Oxylepides* based on densely flowered panicles, conspicuous lateral nerves on the lemma, and spikelets several times wider than thick. We feel these five species in the *E. spectabilis*-*E. secundiflora* group perhaps represent a lineage within the New World *Eragrostis*.

Other species in the Flora region without immediate sisters include *E. spicata* in sect. *Sporoboloides* with spiciform panicles with short branches, small 2–4-flowered spikelets, and grains falling free like the dropseeds (*Sporobolus*); *E. capillaris* in subsect. *Capillares* with large robust panicles 1/2 or more the length of the culm, capillary branches, and hyaline, few-flowered spikelets; *E. ciliaris* in subsect. *Amabiles* with ciliate (tuberculate) paleas ["group 6" of Lazarrides (1997); "group 3" of Cope (1998)]; *E. sessilspica* in sect. *Acamptocladus* with sessile or nearly so spikelets, stiffly spreading panicle branches, and ap-

pressed spikelets; and *E. superba* in sect. *Platystachya* with the entire spikelets that fall with the glumes and florets attached ["group 5" of Lazarides (1997); "group 6" of Cope (1998)] (Harvey 1948). The enigmatic, *Eragrostis obtusiflora* is currently being investigated by Travis Columbus (per. comm.) and Maricela Sanchez, where it appears members of the Monanthochloinae are more closely related than other species of *Eragrostis* (see comments under this species).

KEY TO THE SPECIES OF *ERAGROSTIS* IN NORTHEASTERN MÉXICO

1. Plants annual, caespitose or mat-forming, without innovations at the basal nodes.
   2. Palea keels prominently ciliate, the cilia 0.2–0.8 mm long.
      3. Spikelets 1.8–3.2 mm long, 1–2 mm wide, with 6–11 florets; lemmas 0.8–1.3 mm long without glands on the keels; anthers 2 _____ **1. E. ciliaris**
      3. Spikelets 6–20 mm long, 2–4 mm wide, with 10–40 florets; lemmas 2–2.8 mm long with 1–3 crateriform glands on the keels; anthers 3 _____ **3. E. cilianensis**
   2. Palea keels smooth or scabrous, the cilia less than 0.2 mm long.
      4. Plants mat-forming; panicles 1–3.5 cm long; erect portion of culms (2–)5–20 cm tall, the basal portion prostrate and rooting at the nodes.
         5. Spikelets bisexual; anthers 2, 0.2–0.3 mm long _____ **11. E. hypnoides**
         5. Spikelets and plants unisexual; anthers 3, 1.4–2.2 mm long _____ **20. E. reptans**
      4. Plants usually not forming mats; panicles 3–55 cm long; culms (5–)8–130 cm tall, not prostrate or rooting at the lower nodes.
         6. Caryopses with a shallow or deep ventral groove, ovoid to rectangular-prismatic, the surface striate.
            7. Spikelets 4–11 mm long, with 5–11(–15) florets; pedicels 1–6(–7) mm long, somewhat divergent to appressed; panicles less than 1/2 the height of the plant _____ **15. E. mexicana**
            7. Spikelets (1.4–)2–5 mm long, with 2–5(–7) florets; pedicels (4–)5–25 mm long, divergent; panicles 2/3 or more the height of the plant _____ **2. E. capillaris**
         6. Caryopses without a ventral groove, usually globose, pyriform, ovoid to prism-shaped, or ellipsoid, the surface smooth to faintly striate.
            8. Plants without glandular pits or bands.
               9. Lower glumes 0.5–1.5 mm long, at least 1/2 as long as the lowest lemmas; spikelets 1.2–2.5 mm wide; panicle branches solitary or paired at the lowest 2 nodes; lemmas with moderately conspicuous lateral veins _____ **18. E. pectinacea**
               9. Lower glumes 0.3–0.6(–0.8) mm long, usually less than 1/2 as long as the lowest lemmas; spikelets 0.6–1.4 mm wide; panicle branches usually whorled at the lowest 2 nodes; lemmas with inconspicuous lateral veins _____ **19. E. pilosa**
            8. Plants with glandular pits or bands somewhere, the location(s) various, including any or all of the following: below the cauline nodes, on the sheaths, blades, rachises, panicle branches, or pedicels, or on the keels of the lemmas.
               10. Spikelets 0.6–1.4 mm wide; pedicels 1–10 mm long, lax, appressed or divergent _____ **19. E. pilosa**
               10. Spikelets 1.1–4 mm wide; pedicels 0.2–4 mm long, stiff, straight, usually divergent.
                  11. Lemmas 2–2.8 mm long, with 1–3 crateriform glands along the keels; spikelets 6–20 mm long, 2–4 mm wide, with 10–40 florets;

disarticulation below the florets, the rachillas persistent; anthers yellow ____ **3. E. cilianensis**

11. Lemmas 1.4–1.8 mm long, without crateriform glands along the keels; spikelets 4–7(–11) mm long, 1.1–2.2 mm wide, with 7–12(–20) florets; disarticulation below the lemmas, both the paleas and rachillas usually persistent; anthers reddish-brown ____ **1. E. barrelieri**

1. Plants perennial, sometimes rhizomatous, forming innovations at the basal nodes.
12. Paleas with a broad lower portion forming a wing or tooth on each side, these often projecting beyond the lemmas ____ **26. E. superba**
12. Paleas without a broad lower portion forming a wing or tooth, the bases never projecting beyond the lemmas.
13. Plants rhizomatous; disarticulation always below the florets, the paleas falling with the lemmas and caryopses.
14. Plants with long, scaly rhizomes, 4–8 mm thick; spikelets 8–14 mm long; lemmas 3.8–4.5 mm long, 3–5-veined, the apices acute to obtuse, usually erose; caryopses 1.6–2 mm long ____ **16. E. obtusiflora**
14. Plants with short, knotty rhizomes less than 4 mm thick, often stout but never elongated; spikelets 2.5–7.6 mm long; lemmas 1–2.5 mm long, 3-veined, the apices acute, usually entire; caryopses 0.5–0.8 mm long.
15. Sheaths, blades, and culms not viscid or glandular; caryopses strongly flattened, the ventral surface with 2 prominent ridges separated by a groove; anthers 0.3–0.5 mm long; lemmas leathery ____ **24. E. spectabilis**
15. Sheaths, blades, and/or culms often viscid, sometimes glandular; caryopses terete, the ventral surfaces without 2 ridges separated by a groove; anthers 0.2–0.4 mm long; lemmas membranous.
16. Pedicels 0.2–1.2 mm long, appressed; lemmas 1.5–2.2 mm long; caryopses 0.6–0.8 mm long ____ **5. E. curtipedicellata**
16. Pedicels (1–)1.5–12 mm long, divergent or appressed; lemmas 1.1–1.4 mm long; caryopses 0.5–0.6 mm long ____ **23. E. silveana**
13. Plants not rhizomatous; disarticulation often below the lemmas, the paleas persistent, sometimes below the florets and the paleas falling with the lemmas and caryopses.
17. Panicles 0.3–0.6 cm wide, spicate, dense; spikelets with 2 or 3 florets ____ **25. E. spicata**
17. Panicles 1–45 cm wide, ovate to obovate or elliptic, open to somewhat condensed and glomerate; spikelets with 1–45 florets.
18. Caryopses with shallowly to deeply grooved adaxial surfaces, rectangular-prismatic to ellipsoid, ovoid, or obovoid in overall shape.
19. Caryopses strongly dorsally compressed, translucent, mostly light brown, bases sometimes greenish.
20. Lemmas 1.8–3 mm long; panicles 16–35(–40) cm long, (4–)8–24 cm wide; blades 12–50(–65) cm long; caryopses 1–1.7 mm long; ligules 0.6–1.3 mm long ____ **6. E. curvula**
20. Lemmas 1.5–1.7 long; panicles 7–18 cm long, 2–8 cm wide; blades 2–12 cm long; caryopses 0.6–0.8 mm long; ligules 0.3–0.5 mm long ____ **13. E. lehmanniana**
19. Caryopses laterally compressed, terete, or slightly dorsally compressed, usually opaque, usually reddish-brown.

21. Lemmas 1.2–1.6 mm long; culms (20–)30–50(–60) cm tall; sheaths usually glabrous _____ **14. E. lugens**
21. Lemmas 1.6–3 mm long; culms (30–)40–170 cm tall; sheaths usually hairy.
    22. Sheaths with papillose-based hairs near the apices and margins.
        23. Spikelets with 2–4 florets, 1–1.5 mm wide, lanceolate, greenish with a purplish tinge; bud initiation usually intravaginal _____ **9. E. hirsuta**
        23. Spikelets with 4–7 florets, 1.4–2.0 mm wide, ovate to linear-ovate, plumbeous to reddish-purple; bud initiation usually extravaginal _____ **10. E. hirta**
    22. Sheaths without papillose-based hairs near the apices and margins.
        24. Lemmas 1.6–2.2 mm long; anthers 0.5–0.8 mm long, purplish _____ **12. E. intermedia**
        24. Lemmas 2–3 mm long; anthers 0.6–1.7 mm long, purplish to yellowish.
            25. Caryopses 0.8–1.6 mm long; lemmas 2.4–3 mm long _____ **8. E. erosa**
            25. Caryopses 0.6–0.8 mm long; lemmas 2 2.6mm long _____ **17. E. palmeri**

18. Caryopses not grooved on the adaxial surfaces, ellipsoid, ovoid, obovoid, globose, to pyriform, prism-shaped, and rectangular-prismatic in overall shape.
    26. Anthers 2.
        27. Panicles 15–45 cm wide, diffuse, broadly ovate to obovate, open, diffuse; primary branches lax; pedicels (4–)10–35 (–50) mm long, the pedicels longer than the spikelets; spikelets 1.4–3 mm wide _____ **7. E. elliottii**
        27. Panicles 1–15 cm wide, narrowly oblong to ovate and open; primary branches stiff; pedicels absent or 0–1(–3) mm long, always shorter than the spikelets; spikelets 2.4–5 mm wide _____ **21. E. secundiflora**
    26. Anthers 3.
        28. Primary panicle branches not rebranched; proximal spikelets on each branch sessile or subsessile, the pedicels shorter than 0.4 mm _____ **22. E. sessilispica**
        28. Primary panicle branches with secondary branches; proximal spikelets on each branch pedicellate, the pedicels longer than 0.4 mm.
            29. Spikelets 2–5.5 mm long.
                30. Lemmas 1.2–1.6 mm long; culms (20–)30–50(–60) cm tall _____ **14. E. lugens**
                30. Lemmas 1.6–3 mm long; culms (30–)40–170 cm tall.
                    31. Spikelets with 2–4 florets, 1–1.5 mm wide, lanceolate, greenish with a purplish tinge; bud initiation usually intravaginal _____ **9. E. hirsuta**
                    31. Spikelets with 4–7 florets, 1.4–2.0 mm wide, ovate to linear-ovate, plumbeous to reddish-

purple; bud initiation usually extravaginal ____ **10. E. hirta**

29. Spikelets 4–12 (–14) mm long.
32. Lemmas 1.8–3 mm long; panicles 16–35(–40) cm long, (4–)8–24 cm wide; blades 12–50(–65) cm long; caryopses 1–1.7 mm long; ligules 0.6–1.3 mm long ____ **6. E. curvula**
32. Lemmas 1.5–1.7 long; panicles 7–18 cm long, 2–8 cm wide; blades 2–12 cm long; caryopses 0.6–0.8 mm long; ligules 0.3–0.5 mm long ____ **13. E. lehmanniana**

1. Eragrostis barrelieri Daveau, J. Bot. (Morot) 8:289. 1894. (**Fig. 1, A & B**). *Eragrostis poaeoides* var. *barrelieri* (Daveau) Fiori, F. Italia 1:82. 1908. *Eragrostis vulgaris* ssp. *barrelieri* (Daveau) R.C.V. Douin, Fl. Ill. France 12:32. 1927–1932. TYPE: Plantae per Galliam, Hispaniam et Italiam observatae (type not indicated in the prologue): EGYPT: *Ascheron s.n.* (SYNTYPE: P; ISOSYNTYPE: K); ALGERIA. *Balansa 734* (SYNTYPE: P; ISOSYNTYPE: K); ITALY. SICILY: *Todaro s.n.* (SYNTYPE: P; ISOSYNTYPE: K); SOUTH EUROPE: *Barrelier s.n.* (SYNTYPE: ?).

Caespitose annuals, without innovations. Culms (5–)10–60 cm tall, erect or sprawling to decumbent and prostrate, much-branched near the base, somewhat glaucous, with a ring of glandular tissue below the nodes, rings often shiny or yellowish. Leaf sheaths 1/2–7/8 the length of the internodes, hairy at the apices, hairs to 4 mm long; ligules 0.2–0.5 mm long, ciliate; blades 1.5–10 cm long, 1–3(–5) mm wide, flat, abaxial surfaces glabrous, adaxial surfaces glabrous, sometimes scabridulous, occasionally with white hairs to 3 mm long, margins without crateriform glands. Panicles 4–20 cm long, 2.2–8(–10) cm wide, ovate, open to contracted, rachises with shiny or yellowish glandular spots or rings below the nodes; primary branches 0.5–6 cm long, diverging 20–100° from the rachises; pulvini glabrous; pedicels 1–4 mm, stout, stiff, divergent, without glandular bands. Spikelets 4–7(–11) mm long, 1.1–2.2 mm wide, narrowly ovate, reddish-purple to greenish, occasionally grayish, with 7–12(–20) florets; disarticulation acropetal, paleas persistent; glumes broadly ovate, membranous, 1-veined; lower glumes 0.9–1.4 mm long; upper glumes 1.2–1.6 mm long; lemmas 1.4–1.8 mm long, broadly ovate, membranous, lateral veins evident, apices acute to obtuse; paleas 1.3–1.7 mm long, hyaline, keels scabrous, scabridities to 0.1 mm long, apices obtuse to acute; stamens 3; anthers 0.1–0.2 mm long, reddish-brown. Caryopses 0.4–0.7 mm long, ellipsoid, not grooved, smooth to faintly striate, light brown. $2n = 40, 60$.

Distribution and habitat.—*Eragrostis barrelieri* is an introduced European species that is now naturalized in the Flora region. It grows on gravelly roadsides, in gardens, and other disturbed, sandy sites, especially near railroad yards, at 10–1800 m.

Comments.—The ring of glandular tissue is most conspicuous below the upper cauline nodes.

Specimens examined **MEXICO. Coahuila:** Municipio de Acuña, 13.2 km NE of San Miguel on road towards Boquillas, *P.M. Peterson & C.R. Annable 10614* (US); 13 km from Rancho El Jardín and 5 km S of Mina El Popo, E slope of the Sierra del Carmen, *M.C. Johnston et al. 11862* (MEXU); Rancho Las

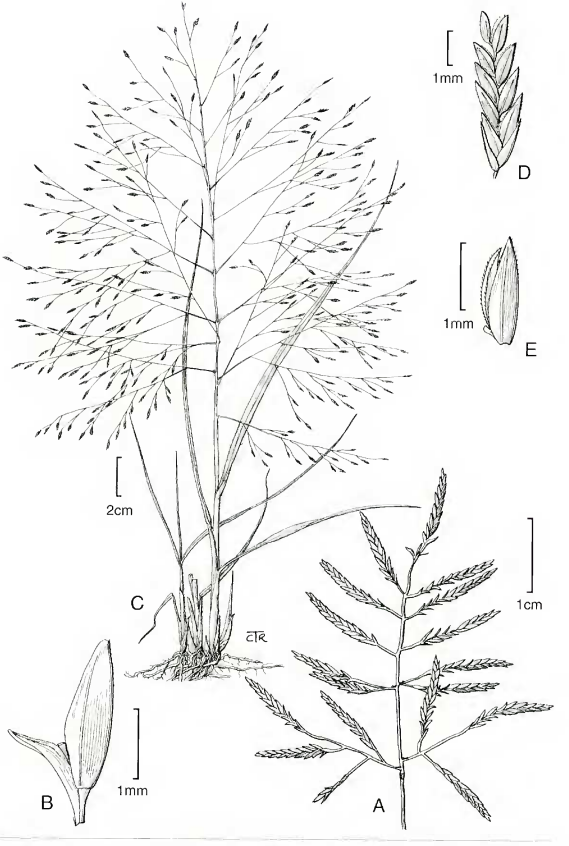

Fig. 1. *Eragrostis barrelieri*. **A.** Inflorescence. **B.** Floret with palea below. *Eragrostis spectabilis*. **C.** Habit. **D.** Spikelet. **E.** Floret.

Norias, *J.A. Villarreal-Quintanilla et al. 6919* (ANSM); Municipio de Castaños, 20.3 km S of Monclova on MEX Hwy 57 towards Saltillo, *P.M. Peterson et al. 10019* (ANSM, US); 32.3 km S of Monclova on MEX Hwy 57 towards Saltillo, *P.M. Peterson et al. 10022* (ANSM, US); La Muralla km 135 carretera Saltillo-Monclova, *H.M. Garza-Cantú s.n.* (MEXU); La Muralla, Sierra de la Gavia, *A. Rodríguez-Gámez et al. 1299* (ANSM); Municipio de Cuatrociénegas, Rancho Cerro de la Madera, *S.D. Koch & M. González L. 8666* (ANSM); Municipio de General Cepeda, Ejido La Rosa, carretera 40 Saltillo-Torreón, @ 20 km NE de General Cepeda, *S. Vásquez-A. & A. García 95* (ANSM); Municipio de Monclova, Orilla de carretera Saltillo-Monclova, @8 km de Castaños, *R. Vásquez-Aldape s.n.* (ANSM); Municipio de Múzquiz, El Sauz, 32 km S de Sabinas, *R. Vásquez-Aldape 211* (ANSM); Sierra La Encantada, cuesta de Malena, @170 km NW of Múzquiz, *M.A. Carranza-Pérez et al. 834* (ANSM, MEXU), 195 km NW of Múzquiz, *R. Vásquez-Aldape 232* (ANSM); 135.4 km NW of Muzquiz on Hwy 53 towards Boquilla del Carmen, *P.M. Peterson & C.R. Annable 10585* (US); Municipio de Ramos Arizpe, Cañada el Diente, Sierra de la Paila, *J.A. Villarreal-Quintanilla & M. A. Carranza P. 5194* (ANSM); Sierra de la Paila (Lado Norte) Cañada Becerros, *J.A. Villarreal-Quintanilla et al. 5447* (ANSM); Municipio de Saltillo, Buenavista, 7 km S de Saltillo, carretera 54 Saltillo-Concepción del Oro, Zacatecas, *J. Valdés-Reyna & M.A.Carranza P. 1131* (ANSM, MEXU); Ciudad de Saltillo, colonia los Arcos, *J. Espinosa-Aburto 33* (ANSM); Universidad Autónoma Agraria Antonio Narro, 7 km S of Saltillo, *F. Cárdenas & M. A. Bernal s.n* (MEXU); Municipio de San Buenaventura, Sierra La Encantada, Rancho Carrizalejo, *R. Vásquez-Aldape, et al. 244* (ANSM); 12 mi W of San Buenaventura, *J.R. Reeder & C.G. Reeder 3929* (US). **Nuevo León:** Municipio de Bustamante, En el Cañón de Bustamante, *P. Jauregui-Ramírez 61* (COCA); Municipio de Cadereyta Jiménez, Orilla del Río San Juan, *P.A. García-Martínez 1809* (COCA); Municipio de Cienega de Flores, 2 km S of Cienega de Flores, *S.D. Koch & I. Sánchez-Vega 7868* (US); Municipio de Doctor González, 1 km al SE de Doctor González, *N. Bazaldua-Bazaldua 72* (COCA); Municipio de García, Límites de Coahuila-Nuevo León por la carretera a Saltillo, *J.A. Ochoa-Guillemar 1216* (COCA); Municipio de Los Ramones, Los Ramones, *J.A. Villarreal-Quintanilla 7246* (ANSM); Municipio de Marín, Facultad de Agronomía, Universidad Autónoma de Nuevo León, km 17, *M.M. Castillo-Badillo 16* (COCA); Municipio de Mina, 3 km N of Rancho Lechuguillal, *M.C. Johnston et al. 10211* (MEXU, TEX-LL); Municipio de Pesquería, Santa María la Floreña, a 2 km del municipio de Pesquería, *P. Jauregui-Ramírez 59* (COCA); Municipio de Salinas Victoria, km 69 carretera Monterrey-Sabinas Hidalgo, *N. Bazaldua-Bazaldua 51* (COCA); Sierra de Mamulique, M.M. *Castillo-Badillo 33* (COCA); Municipio de Santiago, km 20 Carretera Monterrey-Villa de Santiago, *P. Jauregui-Ramírez 29* (COCA); Sin Municipio, Carretera a Trinidad China, *J.A. Ochoa-Guillemar 1229* (COCA); Carretera Monterrey-Marín entronque con la carretera a Zuazua, *P.A. García-Martínez 1844* (COCA). **Tamaulipas:** Municipio de Casas, Ejido Las Tortugas, *C.R. López-Aguilar 121* (COCA); Mesa La Pitaya, *J.F. Iribe-Duarte 280* (COCA); Municipio de Guerrero, El Puerto, *R.A. Carranco-Rendon 408* (COCA); Municipio de Gustavo Diaz Ordaz, Camino Díaz Ordaz-General Bravo, *J.A. Franco-López 127* (COCA); Municipio de Hidalgo, Ejido Nicolás Bravo, *J. Cantú 42* (COCA); San Francisco, *R. Díaz-Pérez 289* (UAT); Municipio de Llera, Camino al Ejido Lucio Blanco, *J.L. Ramos-Delgado 221* (COCA); Llera-Guayalejo, *J.E. López de la Cruz 130* (COCA); Municipio de Matamoros, Buenavista, *M.H. Cervera-Rosado 43* (COCA); Municipio de Miguel Alemán, Brecha de Pemex, *C.R. López-Aguilar 209* (COCA); Municipio de Nuevo Morelos, Rancho El Tampiquito, *J.A. Barrientos-B. 35* (COCA); Municipio de Reynosa, Ejido Llorona, *M. Herrera s.n.* (UAT); Municipio de San Fernando, 15 km carretera a Carboneros, *R.A. Carranco-Rendon 350* (COCA); Carretera a Carboneros, *R.A. Carranco-Rendon 349* (COCA); Municipio de Soto la Marina, Rancho El Trece, *J.A. Franco-López 86* (COCA); Rancho San Francisco, *P. Moya-Salgado 275* (COCA); Municipio de Tula, Camino al Ejido Tanque Blanco, *J.G. Galván-Infante Guadalupe 184* (COCA); Municipio de Victoria, Avenida 16 en las calles de Coahuila, *M. Yañez-Pacheco 435* (COCA); Cañón del Novillo, *J.A. Mortera s.n.* (UAT); Unidad Dep. Rev. Verde, Ciudad Victoria, *P. Moya-Salgado 66* (COCA); Municipio de Villagrán, La Antena de la Secretaría de Comunicaciones y Transportes, *J.A. Franco-López 96* (COCA), *M.H. Cervera-Rosado 363* (COCA); Municipio de Xicoténcatl, Ejido Pedro José Méndez, *R.A. Carranco-Rendon 359* (COCA).

2. Eragrostis capillaris (L.) Nees, Fl. Bras. Enum. Pl. 2:505. 1829. (**Fig. 2, A–D**). *Poa capillaris* L., Sp. Pl. 68. 1753. *Eragrostis capillaris* (L.) Steud., Syn. Pl. Glumac. 1:273. 1854, *nom. illeg. hom. Eragrostis pilosa* var. *capillaris* (L.) Kuntze, Revis. Gen. Pl. 3:353. 1898. TYPE: NORTH AMERICA: *Kalm s.n.* (LECTOTYPE: LINN-87.27, designated by Hitchcock, Contr. U.S. Natl. Herb 12:121. 1908.).

Aira capillacea Lam., Tabl. Encycl. 1:177. 1791. TYPE: U.S.A. E. Carolina, *D. Fraser s.n.* (HOLOTYPE: P-LAM; ISOTYPE: US-763011 fragm. ex P-LAM!).

Poa tenuis Elliott, Sketch Bot. S. Carolina 1(2):156. 1816, nom. illeg. hom. *Eragrostis tenuis* Steud., Syn. Pl. Glumac. 1:273. 1854, nom. nov. as comb. TYPE: U.S.A. SOUTH CAROLINA: Greenville Co.: Aug, *Moultrie s.n.* (HOLOTYPE: CHARL-3985).

Caespitose annuals, without innovations. Culms (15–)20–50(–60) cm tall, erect, glabrous, often shiny below the nodes. Leaf sheaths overlapping, 1–2 1/2 as long as the internodes, pilose along the margins, apices hirsute, hairs to 7 mm long; ligules 0.2–0.5 mm long, ciliate; blades (6–)8–20(–30) cm long, (1–)2–5 mm wide, flat, abaxial surfaces smooth, glabrous, adaxial surfaces scabridulous, with long scattered hairs. Panicles (10–)15–45(–55) cm long, (7–)10–25 cm wide, to 2/3 the height of the plants, elliptic to ovate, open, rachises without glandular pits; primary branches (2–)5–15 cm long, diverging 20–90° from the rachises, capillary, naked basally; pulvini glabrous; pedicels (4–)5–25 mm long, divergent, scabridulous. Spikelets (1.4–)2–5 mm long, 1–1.3(–1.4) mm wide, ovate to lanceolate, plumbeous, occasionally reddish-purple, with 2–5(–7) florets; disarticulation acropetal, paleas persistent; glumes narrowly lanceolate to lanceolate, hyaline; lower glumes 1–1.2 mm long, narrower than the upper glumes; upper glumes 1.2–1.4 mm long; lemmas 1.2–1.7 mm long, broadly ovate, membranous, keels scabridulous, lateral veins inconspicuous, apices acute; paleas 1.2–1.6 mm long, hyaline, keels almost smooth to scabrous, scabridities to 0.1 mm long, apices acute to obtuse; stamens 3; anthers 0.2–0.3 mm long, reddish-brown. Caryopses 0.4–0.7 mm, ovoid to rectangular-prismatic, adaxial surfaces deeply grooved, striate, bases reddish-brown, distal 2/3 opaque. $2n = 50, 100$.

Distribution and habitat.—*Eragrostis capillaris* is native to the eastern portion of the Flora region. It grows in open, dry, sandy riverbanks, floodplains, rocky roadsides, and gravel pits, usually in association with *Pinus*, *Quercus*, *Carrya*, and *Liquidambar styraciflua*. Its range extends into the eastern United States; 300–600 m.

Comments.—Distinguishing features of *E. capillaris* include the panicle which is often 2/3 or more the height of the plant and the pedicels that are widely divergent and longer than the spikelets.

Specimen examined. **MEXICO. Tamaulipas:** Municipio de Casas, El Piruli, *J.F. Tribe-Duarte 238* (COCA).

3. Eragrostis cilianensis (All.) Vignolo ex Janch., Mitt. Naturwiss. Vereins Univ Wien, n.s., 5:110. 1907. (**Fig. 3, A–C**). *Poa cilianensis* All., Fl. Pedem. 2:246. 1785.

Eragrostis megastachya var. *cilianensis* (All.) Asch. & Graebn., Syn. Mitteleur. Fl. 2:371. 1900.

Eragrostis cilianensis (All.) Vignolo, Malpighia 18:386. 1904, nom. inval. *Eragrostis cilianensis* (All.) Link ex Vignolo, Malpighia 18:386. 1904, *nom. inval. Eragrostis cilianensis* (All.) FT.

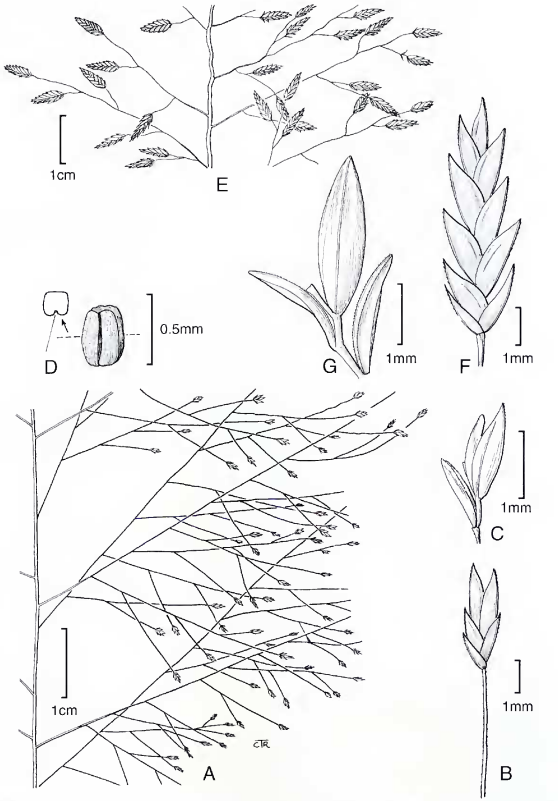

FIG. 2. *Eragrostis capillaris*. **A.** Inflorescence. **B.** Spikelet. **C.** Floret with palea below. **D.** caryopsis. *Eragrostis mexicana* subsp. *mexicana*. **E.** Inflorescence. **F.** Spikelet. **G.** Floret with two paleas below.

Hubb., Philipp. J. Sci. 8:159–161. 1913. *Eroision ctlianense* (All.) Lunell, Amer Midl. Naturalist 4:221. 1937. *Eragrostis multiflora* var. *cilianensis* (All.) Maire, Bull. Soc. Hist. Nat. Afrique N. 30:369. 1939. TYPE: ITALY: Ciliani, *Bellardi s.n.* (SYNTYPE: K-photo!, TO-8242!); *Balbi s.n.* (SYNTYPE: TO).

Caespitose annuals, without innovations. Culms 15–45(–65) cm tall, erect or decumbent and prostrate, sometimes with crateriform glands below the nodes. Leaf sheaths overlapping below, 2/3 the length of the internodes above, glabrous, occasionally glandular; apices hairy, hairs to 5 mm long; ligules 0.4–0.8 mm long, ciliate; blades (1–)5–20 cm long, (1–)3–5(–10) mm wide, flat to loosely involute, abaxial surfaces glabrous, sometimes glandular near margins, adaxial surfaces scabridulous, occasionally also hairy. Panicles (3–)5–16(–20) cm long, 2–8.5 cm wide, oblong to ovate, condensed to open; primary branches 0.4–5 cm long, appressed or diverging 20–80° from the rachises; pulvini glabrous or hairy; pedicels 0.2–3 mm long, stout, straight, stiff, usually divergent, occasionally appressed. Spikelets 6–20 mm long, 2–4 mm wide, ovate-lanceolate, plumbeous, greenish, with 10–40 florets; disarticulation below the florets, each floret falling as a unit, rachillas persistent; glumes broadly ovate to lanceolate, membranous, usually glandular; lower glumes 1.2–2 mm long, usually 1-veined; upper glumes 1.2–2.6 mm long, often 3-veined; lemmas 2–2.8 mm long, broadly ovate, membranous, keels with 1–3 crateriform glands, apices obtuse to acute; paleas 1.2–2.1 mm long, hyaline, keels scabrous, sometimes also ciliate, cilia to 0.3 mm long, apices obtuse to acute; stamens 3; anthers 0.2–0.5 mm long, yellow. Caryopses 0.5–0.7 mm long, globose to broadly ellipsoid, smooth to faintly striate, not grooved, reddish-brown or translucent. $2n = 20$.

Distribution and habitat.—*Eragrostis cilianensis* is an introduced European species that now grows in disturbed sites such as pastures and roadsides through most of the North America; 0–2300 m.

Comments.—The nomenclature of *E. cilianensis* has been a bit chaotic, and the conclusions of Simon (1983) have been adopted. The most prominent feature of this species is the presence of 1–3 crateriform glands on the keel of the lemma.

Specimens examined. **MÉXICO. Coahuila:** Municipio de Acuña, 13.2 km NE of San Miguel on road towards Boquillas, *P.M. Peterson & C.R. Annable 10615* (US); Municipio de Cuatrociénegas, Rancho Cerro de la Madera, *S.D. Koch & M. González L. 8659* (ANSM); Municipio de Nadadores, 7.2 mi W of Nadadores on Mex Hwy 30 towards Cuatrocienegas, *P.M. Peterson et al. 10015* (US); Municipio de Nava, @10 km W of Nava, *A. Rodriguez-Gámez et al. s.n.* (ANSM); Municipio de Ocampo, Sierra El Pino, 18.8 km SW of Rancho El Cimarron, *P.M. Peterson & C.R. Annable 10644* (US); Rancho Las Gallinas, @ 43 km de Ocampo rumbo a Sierra Mojada, *M.A. Carranza-Pérez & F.J. Carranza P. 507* (ANSM, TEX); Sierra de la Madera, Rancho Laguna de la Leche, @62 km de Ocampo rumbo a Sierra Mojada, *M.A. Carranza-Pérez & F.J. Carranza P. 613* (ANSM); Sierra de las Cruces, between San Rafael and San Vicente, *I.M. Johnston & C.H. Miller 1038* (US); 4 km W of Santa Eleana, *R.M. Stewart 828* (US); 7 mi S of Jaco, *I.M. Johnston & C.H. Miller 1110* (US); Municipio de Parras, Carretera Saltillo-Torreón, *C. Castillos.n.* (ANSM); Municipio de Ramos Arizpe, Estación Paredón, *A. Rodriguez-Gámez et al. 904* (ANSM); Municipio de Sabinas, Sabinas, *E.W. Nelson 6823* (US); Municipio de Saltillo, Saltillo, *E. Palmer 389, A.S. Hitchcock 5633* (US); Buenavista, 7 km N of Saltillo, *F.W. Gould & D. Watson 10494* (US);

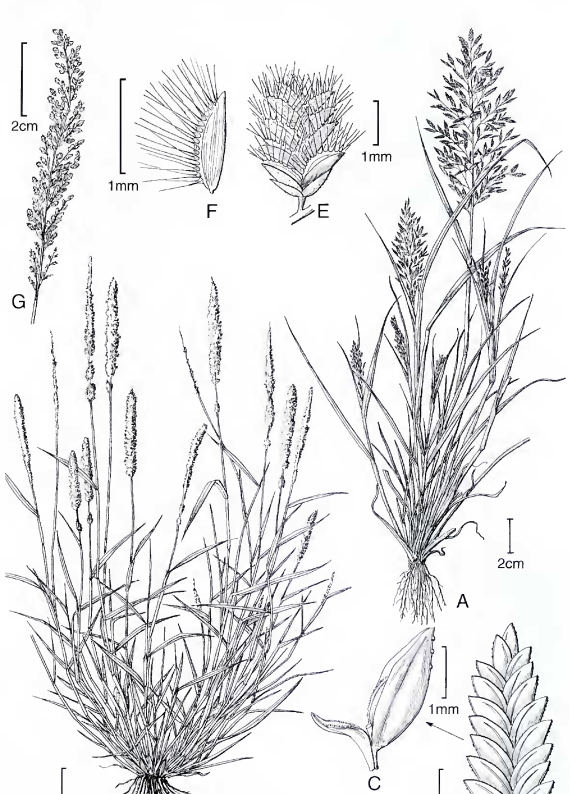

FIG. 3. *Eragrostis cilianensis*. **A.** Habit. **B.** Spikelet. **C.** Floret with palea below. *Eragrostis ciliaris* var. *ciliaris*. **D.** Habit. **E.** Spikelet. **F.** Palea. *Eragrostis ciliaris* var. *laxa*. **G.** Inflorescence.

Municipio de San Buenaventura, Sierra La Encantada, Rancho Carrizalejo, entrada S al rancho Puerto del Aire, *R. Vásquez-Aldape et al. s.n.* (ANSM); Municipio de San Pedro, 10 km NE of Las Margaritas in Valle del Sobaco, *M.C. Johnston et al. 9488* (MEXU); Municipio de Torreón, S of Torreón, canyon between Jimilco and Juan Eugenio, *P.M. Peterson & J. Valdés-Reyna 8468* (US); unknown Municipio, 16 km E of Puerto Caballo towards Tanque Jerico, *M.C. Johnston 8330* (MEXU). **Nuevo León:** Municipio de Allende, Río Ramos, 1 km S de Allende, carretera 85, *J.A. Villarreal-Quintanilla et al. 6794* (ANSM); Municipio de Cadereyta Jiménez, Orilla del Río San Juan a 1 km del poblado San Juan, *P. García-Martínez 1810* (COCA); Municipio de Galeana, 32 km N of San Roberto, 8 km S de San Rafael, *S. L. Hatch et al. 4586* (ANSM); Municipio de Linares, 2 km E del Ejido El Sauz, *J.J. Ortiz-Díaz 7* (ANSM); Municipio de Monterrey, Monterrey at Campo Agricola Experimental, *A. Cuevas 250* (US); Municipio de Salinas Victoria, La Soledad Salinas Victoria, *J.A. Ochoa-Guillemar 1153* (COCA); Municipio de San Nicolás de los Garza, Ciudad Universitaria, *I.A. Jiménez-Valdés s.n.* (ANSM). **Tamaulipas:** Municipio de Jiménez, 10 km from Santander Jiménez on the road to San Fernando, *F. Martínez-Martínez & G. Borja L. 2453* (TEX-LL.); Municipio de Gonzalez, Sierra de Tamaulipas between La Chona and Rio Santa Olaya, *F. Martínez-Martínez & G. Borja L. F-2146* (US); Municipio de Llera, La Herradura, *G. Bores-Kulman 3* (COCA); Municipio de San Carlos, Cerro del Diente, *R. Sandoval-Hernández 16* (COCA), Cerro Tres Vetas, *H.H. Bartlett 10363* (US); Cerro Parreña, *H.H. Bartlett 10290* (US); Municipio de San Fernando, 5 km from San Fernando on the Victoria highway, *F. Martínez-Martínez & G. Borja L. 2398* (TEX-LL., US); ; Municipio de Soto la Marina, Rancho Los Tripones, *J.A. Franco-López 36* (COCA); Tramo San José de las Rusias-Ejido 5 de Mayo, *J.A. Franco-López 73* (COCA); Municipio de Tula, Ejido Alfonso Terrones Benitez, *J.G. Galván-Infante 190* (COCA); Municipio de Victoria, Libramiento Portes Gil, *M.H. Cervera-Rosado 313* (COCA); Vicinity of Victoria, *E. Palmer 473* (US); Municipio de Xicoténcatl, Ejido La Esperanza, *J.A. Franco-López F. Martínez-Martínez & G. Borja L. 51* (COCA).

4. Eragrostis ciliaris (L.) R. Br., Narr. Exped. Zaire 478. 1818. *Poa ciliaris* L., Syst. Nat. (ed. 10) 875. 1759. *Megastachya ciliaris* (L.) P. Beauv., Ess. Agrostogr. 74, 167, 174. 1812. *Cynodon ciliaris* (L.) Raspail, Ann. Sci. Nat., Bot. 5:302. 1825. *Eragrostis ciliaris* (L.) Nees, Fl. Bras. Enum. Pl. 2:512–514. 1829. TYPE: JAMAICA: *Browne s.n.* (LECTOTYPE: LINN-87.66, designated by Hitchcock, Contr. U.S. Natl. Herb. 12:121. 1908.).

Caespitose annuals, without innovations. Culms (3–)9–75 cm tall, erect or geniculate in the lower portion, not rooting at the lower nodes, glabrous. Leaf sheaths 1/2–3/4 as long as the internodes, hairy on the margins and at the apices, hairs to 4 mm long; ligules 0.2–0.5 mm long; blades 1.8–12(–15) cm long, 2–5 mm wide, usually flat, occasionally involute, glabrous or ciliate basally. Panicles 1.7–17 cm long, 0.2–5 cm wide, cylindrical, contracted or open, spike-like, branches forming glomerate lobes or sometimes more open, often interrupted in the lower portion; primary branches 0.4–4 cm, appressed or diverging up to 50° from the rachises; pulvini usually glabrous, occasionally sparsely pilose; pedicels 0.1–1 mm long, erect, shorter than the spikelets, glabrous. Spikelets 1.8–3.2 mm long, 1–2 mm wide, elliptical-ovate to ovate-lanceolate, yellowish-brown, sometimes with a purple tinge, with 6–11 florets, densely packed next to one another or widely separated; disarticulation basipetal, glumes persistent; glumes ovate to lanceolate, keels scabridulous, veins commonly green, apices acute; lower glumes 0.7–1.2 mm long; upper glumes 1–1.6 mm long; lemmas 0.8–1.3 mm long, elliptical-ovate to lanceolate, membranous, keels scabridulous, lateral veins evident,

apices obtuse to acute; paleas 0.8–1.3 mm long, membranous, keels prominently ciliate, cilia 0.2–0.8 mm long, apices obtuse to acute; anthers 2, 0.1–0.3 mm long, purplish. Caryopses 0.4–0.5 mm long, ovoid, reddish-brown. $2n = 20, 40$.

Distribution and habitat.—*Eragrostis ciliaris* is apparently native to the paleotropics and introduced and naturalized in México and the United States, growing along roadsides, on waste sites, in xerothermic vegetation, and sometimes in saline habitats; 0–1950 m. It may be more widespread than indicated. *Eragrostis ciliaris* var. *ciliaris* is more common than *E. ciliaris* var. *laxa* in the *Flora* region.

KEY TO THE VARIETIES OF *ERAGROSTIS CILIARIS*

1. Panicles 0.2–1.5 cm wide, contracted, the branches mostly appressed to the rachises, congested, forming glomerate lobes; spikelets densely packed _____ **4a. E. ciliaris** var. **ciliaris**
1. Panicles 1.5–5 cm wide, open, the branches spreading 20–50° from the rachises; spikelets widely separated from each other _____ **4b. E. ciliaris** var. **laxa**

4a. Eragrostis ciliaris (L.) R. Br. var. **ciliaris** (**Fig. 3, D–F**).

Panicles 0.2–1.5 cm wide, contracted; primary branches mostly appressed to the rachises, forming glomerate lobes. Spikelets densely packed.

Specimens examined. **MEXICO. Coahuila:** Municipio de Arteaga, Sierra de Arteaga, 50 km SE de Saltillo, *M.A. Madrigal-A. s.n.* (ANSM). **Tamaulipas:** Municipio de Aldama, between La Concepcion and Aldama, *F. Martinez-Martinez & G. Borja L. F-2176*; Municipio de Bustamante, El Capulin, *C.R. López-Aguilar 197* (COCA); Municipio de Gonzalez, Sierra de Tamaulipas between La Chona and Rio Santa Olaya, *F. Martinez-Martinez & G. Borja L. F-2148* (US); Municipio de Mante, El Mante to Limon, *J.R. Swallen 1614* (US); Municipio de Nuevo Laredo, 20 km W of Ciudad Guerrero, *F. González-Medrano et al. 6320* (MEXU); Municipio de Palmillas, Las Enramadas, *C.R. López-Aguilar 194* (COCA); Municipio de Soto La Marina, Chamal, *J.R. Swallen 1643* (US); Municipio de Tampico, vicinity of Tampico, *E. Palmer 147* (US); Tampico, *A.S. Hitchcock 5791* (US); 8 km E of Tampico, *E. Palmer 391* (US); Municipio de Victoria, Ejido La Libertad, *J.F. Iribe-Duarte 404* (COCA); vicinity of Victoria, *E. Palmer 481* (US).

4b. Eragrostis ciliaris var. **laxa** Kuntze (**Fig. 3, G**).

Panicles 1.5–5 cm wide, open; primary branches spreading 20–50° from the rachises. Spikelets widely separated from each other.

Specimens examined. **MÉXICO. Tamaulipas:** Municipio de Soto La Marina, San José de las Rusias, *M.H. Cervera-Rosado 85* (COCA); Municipio de Victoria, Ciudad Victoria, *M.H. Cervera-Rosado 287* (COCA).

5. Eragrostis curtipedicellata Buckley, Proc. Acad. Nat. Sci. Philadelphia 14:97. 1862. (**Fig. 4, A & B**). *Eragrostis brevipedicellata* A. Gray, Proc. Acad. Nat. Sci. Philadelphia 14:336. 1862, *nom. inval.* TYPE: U.S.A. NORTHERN TEXAS: *Buckley s.n.* (LECTOTYPE: PH, designated by Hitchcock, Man. Grasses U.S. 849. 1935, but without citing a specific sheet in a specific herbarium).

Eragrostis viscosa Scribn., Bull. Div. Agrostol., U.S.D.A. 11:51, t. 7. 1898, nom. illeg. hom. TYPE: U.S.A. TEXAS: Midland, 2 Aug 1897, *J.G. Smith s.n.* (SYNTYPE: US-1768944!); Laredo, *Mrs. Anna B. Nickels s.n.* (SYNTYPE: US!).

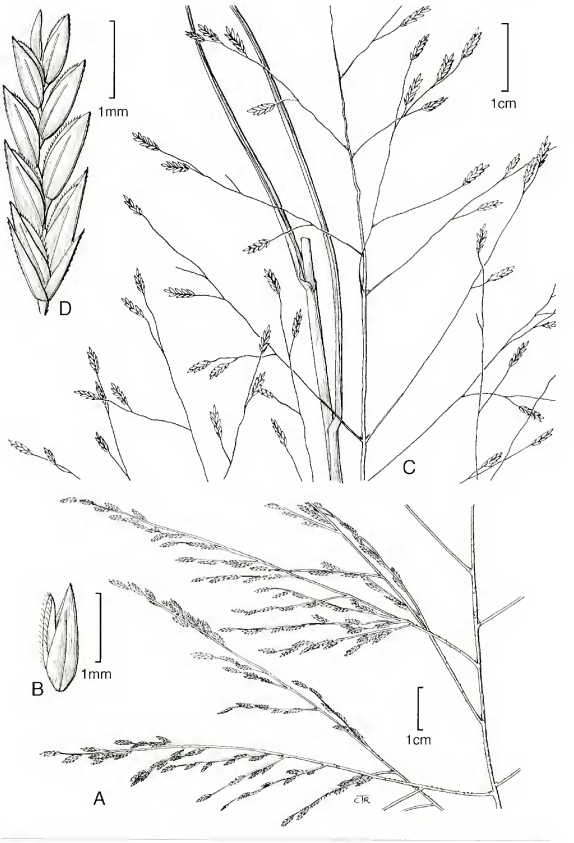

Fig. 4. *Eragrostis curtipedicellata*. **A.** Inflorescence. **B.** Floret. *Eragrostis silveana*. **C.** Inflorescence with portion of culm. **D.** Spikelet.

Caespitose perennials with innovations and short, knotty rhizomes less than 4 mm thick. Culms 20–65 cm tall, erect, viscid or gummy below the nodes, usually with particles of soil adhering to the surface. Leaf sheaths overlapping, 1–1/2 times as long as the internodes, usually viscid, hairy at the apices and on the collars and margins, hairs to 6 mm long; ligules 0.1–0.3 mm long; blades 5–18 cm long, 2–4(–5) mm wide, flat to involute, sometimes viscid, densely hairy behind the ligules, hairs to 8 mm long. Panicles 18–35 cm long, 10–30 cm wide, broadly ovate, open, sometimes partly enclosed by the sheath below; primary branches 3–18 cm long, diverging 10–90° from the rachises, stiff, viscid, naked basally; pulvini hairy, hairs to 6 mm long; pedicels 0.2–1.2 mm long, appressed. Spikelets 3.5–6(–7.6) mm long, 1–1.5 mm wide, linear-lanceolate, stramineous to reddish-purple, with 4–10 florets; disarticulation basipetal, glumes persistent; glumes lanceolate, membranous; lower glumes 0.9–1.8 mm long; upper glumes 1.2–2 mm long, 1–3-veined; lemmas 1.5–2.2 mm long, ovate to lanceolate, membranous, 3-veined, lateral veins evident, apices acute; paleas 1.2–2 mm long, hyaline, not wider than the lemmas, apices obtuse; stamens 3; anthers 0.2–0.4 mm long, purplish. Caryopses 0.6–0.8 mm long, ellipsoid, terete in cross section, neither ridged nor grooved, faintly striate, reddish-brown. $2n = 40$.

Distribution and habitat.—*Eragrostis curtipedicellata* extends from southern Colorado, Kansas, and Missouri, to northeastern Mexico. It is native to the Flora region and grows near fields, along roadsides, and in the margins of woods; 10–1525 m.

Specimens examined. **MÉXICO. Coahuila:** Municipio de Juárez, 2 mi NW of Juárez on road to Sabinas, *L.H. Harvey & J.T. Witherspoon 9190* (US, TEX-LL); Don Martín Dam, *L.H. Harvey 932* (US). **Nuevo León:** Municipio de General Bravo, 23 mi E of General Bravo on the Reynosa highway, *M.C. Johnston 6063* (TEX-LL); Municipio de Lampazos de Naranjo, Rancho Santa Elena, *G. Nava-Villarreal s.n.* (ANSM, MEXU); Municipio de Montemorelos, near Río Ramos, 2 km NW of Montemorelos, *N.J. Weaver 1024* (TEX-LL).

6. Eragrostis curvula (Schrad.) Nees, Fl. Afr. Austral. Ill. 397. 1841. (**Fig. 5, A–C**).
TYPE: SOUTH AFRICA. CAPE PROVINCE: Cape of Good Hope, *Hesse s.n.* (HOLOTYPE: LE; ISOTYPE: LE-TRIN-2327.01, lower middle specimen!).

Caespitose perennials forming innovations at the basal nodes. Culms (45–)60–150 cm tall, erect, glabrous or glandular. Leaf sheaths 1/3–2/3 the length of the internodes, with scattered hairs, hairs to 9 mm long; ligules 0.6–1.3 mm long; blades 12–50(–65) cm long, 1–3 mm wide, flat to involute, abaxial surfaces glabrous, sometimes scabridulous, adaxial surfaces with scattered hairs basally, hairs to 7 mm long. Panicles 16–35(–40) cm long, (4–)8–24 cm wide, ovate to oblong, open; primary branches 3–14 cm long, diverging 10–80° from the rachises; pulvini glabrous or not, the hairs up to 3 mm long; pedicels 0.5–5 mm long, appressed, flexible. Spikelets 4–8.2(–10) mm long, 1.2–2 mm wide, linear-lanceolate, plumbeous to yellowish, with 3–10 florets; disarticulation irregular to acropetal, proximal rachilla segments persistent; glumes lanceolate, hyaline;

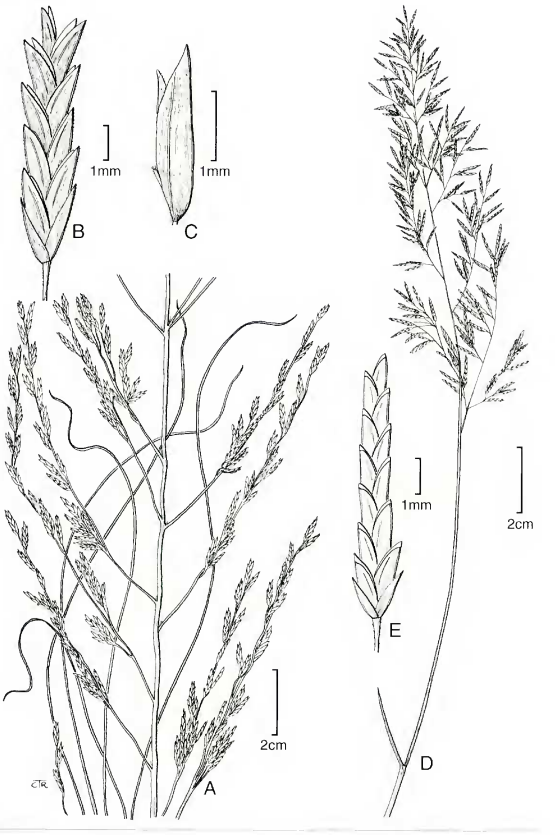

Fig. 5. *Eragrostis curvula*. **A.** Inflorescence with blades. **B.** Spikelet. **C.** Floret. *Eragrostis lehmanniana*. **D.** Inflorescence and culm. **E.** Spikelet.

lower glumes 1.2--2.6 mm long; upper glumes 2–3 mm long; lemmas 1.8–3 mm long, ovate, membranous, lateral veins conspicuous, apices acute; paleas 1.8–3 mm long, hyaline to membranous, apices obtuse; stamens 3; anthers 0.6–1.2 mm long, reddish-brown. Caryopses 1–1.7 mm long, ellipsoid to obovoid, dorsally compressed, adaxial surfaces with a shallow, broad groove or ungrooved, smooth, mostly translucent, light brown, bases often greenish. $2n = 40, 50$.

Distribution and habitat.—*Eragrostis curvula* is native to southern Africa and introduced in the Flora region. It is often used for reclamation because it provides good ground cover but, once introduced, it easily escapes. In the Flora region, it grows on rocky slopes, at the margins of woods, along roadsides, and in waste ground, usually in pine-oak woodlands, and yellow pine and mixed hardwood forests; 10–2000 m.

Comments.—*Eragrostis curvula* is one of two species in the Flora region that has strongly dorsally compressed and translucent caryopses. It can be separated from *E. lehmanniana* (also with dorsally compressed and translucent caryopses) by having longer lemmas (1.8–3 mm verses 1.5–1.7 mm) and taller culms (60–150 cm verses 40–80 cm).

Specimens examined. **MÉXICO. Coahuila:** Municipio de Cuatrociénegas, Rancho La Zacatosa, *M.A. Carranza-Pérez & L. García S. 996* (ANSM); Municipio de Muzquiz, 138 km NW of Muzquiz on Hwy 53 towards Boquilla del Carmen, *P.M. Peterson & C.R. Annable 10592* (US); Municipio de Saltillo, Rancho experimental Los Angeles, 48 km S de Saltillo, carretera 54 Saltillo-Concepción del Oro, Zacatecas, *S.L. Hatch 4549* (ANSM); Buenavista, 7 km S de Saltillo, carretera 54 Saltillo-Concepción del Oro, Zacatecas, *J. Valdés-Reyna & M. A. Carranza P. 922* (ANSM); **Nuevo León:** Municipio de Juárez, Rancho San Marcos, km 7 camino a San Mateo, carretera Villa de Juárez-Cadereyta, *J. Garza-Covarrubias 32* (COCA). **Tamaulipas:** Municipio de Ciudad Madero, Carretera al recreativo, km 1.5, *M.G. Torres-Guzmán s.n.* (ANSM).

7. Eragrostis elliottii S. Watson, Proc. Amer. Acad. Arts 25:140. 1890. (**Fig. 6, A–C**). *Poa nitida* Elliott, Sketch Bot. S. Carolina 1(2):162. 1816, *nom. illeg. hom. Eragrostis nitida* (Elliott) Chapm., Fl. South. U.S. 564. 1860, nom. illeg. hom. TYPE: U.S.A. SOUTH CAROLINA: Paris Island, *Elliott s.n.* (HOLOTYPE: CHARL; ISOTYPE: LE).

Eragrostis macropoda Pilg., Symb. Antill. 4:106. 1903. TYPE: PUERTO RICO: CATAÑO. Bayamón, 27 Mar 1885, *P.E.E. Sintenis 1233* (HOLOTYPE: B?; ISOTYPES: NY-70977!, US-821975!, US-2941525 fragm!).

Eragrostis acuta Hitchc., Proc. Biol. Soc. Wash. 41:159. 1928. TYPE: U.S.A. FLORIDA: Punta Rassa, Jul-Aug 1900, *A.S. Hitchcock 263* (HOLOTYPE: US-731236!; ISOTYPE: US-1503824!).

Caespitose perennials, with innovations. Culms 25–80 cm tall, erect, glabrous and shiny below the basal nodes. Leaf sheaths overlapping, 1.3–3 times as long as the internodes below, sparsely hairy at the apices, hairs to 6 mm long; ligules 0.2–0.4 mm long; blades 6–30(–52) cm long, 2–4.5 mm wide, flat, abaxial surfaces glabrous, adaxial surfaces scabridulous, sometimes with a few scattered hairs near the base. Panicles (25–)30–60 cm long, 15–45 cm wide, broadly ovate to obovate, open, diffuse; primary branches mostly 5–25(–32) cm long, diverging 20–90° from the rachises, capillary, lax; pulvini sparsely hairy; pedicels (4–)

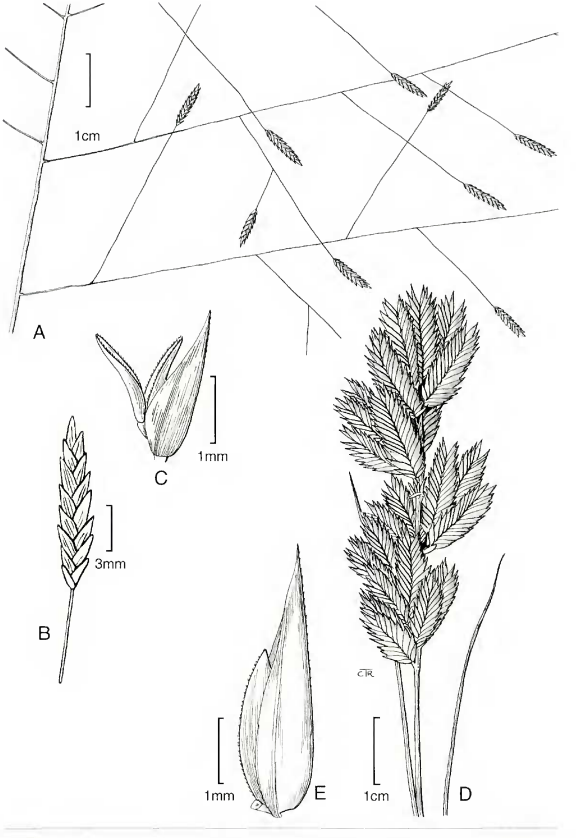

Fig. 6. *Eragrostis elliottii*. **A.** Inflorescence. **B.** Spikelet. **C.** Floret with palea below. *Eragrostis secundiflora* subsp. *oxylepis*. **D.** Inflorescence with blades. **E.** Floret.

10–35(–50) mm long, widely diverging, capillary, all the pedicels on each branch longer than the spikelets. Spikelets 4–18 mm long, 1.4–3 mm wide, linear-lanceolate, grayish-green or stramineous to purplish, with (6–)9–30 florets; disarticulation acropetal, below the lemmas, paleas persistent; glumes narrowly lanceolate, membranous; lower glumes 1.1–3.4 mm long; upper glumes 1.6–3.4 mm long, apices acuminate; lemmas 1.8–4.4 mm long, lanceolate, membranous, lateral veins evident to inconspicuous, sometimes greenish, apices acute to acuminate; paleas 1.1–3.5 mm long, hyaline to membranous, narrower than the lemmas, apices obtuse; stamens 2; anthers 0.3–0.8 mm long, purplish or brownish. Caryopses 0.6–0.8 mm long, ovoid to ellipsoid, finely striate, reddish-brown.

Distribution and habitat.—*Eragrostis elliottii* is native to the Flora region and grows in sandy pinelands and live-oak woodlands on the coastal plain; 0–150 m. Its range extends from the southeastern United States through the West Indies and Gulf coast of Mexico to Central and South America.

Comments.—*Eragrostis elliottii* is characterized by diffuse panicles 15–45 cm wide, lax primary branches, and pedicels longer than the spikelets.

Specimens examined. **MÉXICO. Tamaulipas:** Municipio de Tampico, Tampico, *A.S. Hitchcock 5799* (US-911146).

8. Eragrostis erosa Scribn. ex Beal, Grass. N. Amer. 2:483. 1896. (**Fig. 7, A–C**). TYPE: MÉXICO. CHIHUAHUA: Santa Eulalia Mountains, Oct 1885, *C.G. Pringle 415* (HOLOTYPE: MSC; ISOTYPES: MO-3728015!, US-821925!, US-1749578!).

Caespitose perennials with innovations, not glandular. Culms 70–110 cm tall, erect, glabrous below the nodes. Leaf sheaths overlapping, 1/2 to about as long as the internodes below, hairy at the apices and sometimes on the upper margins, hairs to 4 mm long, not papillose-based; ligules 0.2–0.4 mm long; blades (8–)12–30 cm long, 1.5–3.8 mm wide, flat to involute, abaxial surfaces glabrous, adaxial surfaces scabridulous, glabrous or sparsely hairy, hairs to 4 mm long. Panicles 25–45 cm long, (5–)12–30 cm wide, broadly ovate, open; primary branches mostly 4–20 cm long, diverging 20–90° from the rachises, capillary, sinuous; pulvini glabrous or hairy; pedicels 1–18 mm long, appressed or divergent, proximal spikelets on each branch usually with pedicels shorter than 5 mm long. Spikelets 5–9 mm long, 1–3 mm wide, lanceolate, plumbeous, with 5–12 florets; disarticulation acropetal, glumes first, then the lemmas, paleas persistent; glumes lanceolate to ovate, membranous; lower glumes 1.3–2.4 mm long; upper glumes 1.6–2.6 mm long; lemmas 2.4–3 mm long, ovate, mostly membranous, hyaline near the margins and apices, lateral veins inconspicuous, apices acute; paleas 1.5–3 mm long, hyaline, narrower than the lemmas, apices obtuse to truncate; stamens 3; anthers 0.6–1.7 mm long, purplish. Caryopses 0.8–1.6 mm long, subellipsoid, terete to somewhat laterally compressed, with a well-developed adaxial groove, faintly striate, opaque, reddish-brown.

Distribution and habitat.—*Eragrostis erosa* is native to the Flora region and

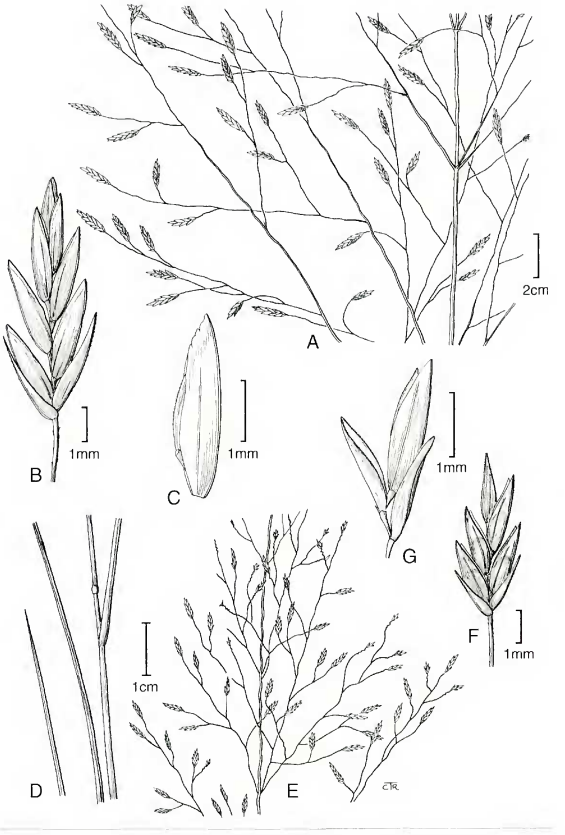

Fig. 7. *Eragrostis erasa*. **A.** Inflorescence. **B.** Spikelet. **C.** Floret. *Eragrostis palmeri*. **D.** Portion of culm and blades. **E.** Inflorescence. **F.** Spikelet. **G.** Floret with two paleas below.

grows on rocky slopes and hills, often in association with *Pinus edulis*, *Juniperus monosperma*, and *Bouteloua gracilis*; 1100–2300 m. Its range extends from northern México to New Mexico and western Texas.

Comments.—*Eragrostis erosa* is morphologically similar to *E. palmeri* but differs from the latter by having longer caryopses (0.8–1.6 mm verses 0.6–0.8 mm) and longer lemmas (2.4–3 mm verses 2–2.6 mm). These two species are sometimes very hard to differentiate; apparently *E. erosa* is much more restricted since it is known from only four locations in the Flora region.

Specimens examined. **MÉXICO. Coahuila:** western base of Picacho del Fuste, NE of Tanque Vaionetta, *I.M. Jonston 8413* (MEXU, US). **Nuevo León:** 3 km S of El Salero, *P.M. Peterson et al. 17832* (US). **Tamaulipas:** Municipio de Llera, La Gloria II, *J.L. Ramos-Delgado 249* (COCA); Municipio de San Carlos, Cerro del Diente, *J.A. Barrientos-B. 81* (COCA).

9. Eragrostis hirsuta (Michx.) Nees, Fl. Bras. Enum. Pl. 2:508. 1829. (**Fig. 8, A–D**)

Poa hirsuta Michx., Fl. Bor.-Amer. 1:68. 1803. TYPE: U.S.A. SOUTH CAROLINA: *Michaux s.n.* (HOLOTYPE: P!, ISOTYPE: US-77389 fragm!).

Eragrostis hirsuta var. *laevivaginata* Fernald, Rhodora 41(490):500–501. 1939. TYPE: U.S.A. VIRGINIA. Southhampton Co.: from wooded alluvial bottomland of Meherrin River, near Haley's Bridge, *M.L. Fernald & B.H. Long 9273* (HOLOTYPE: GH; ISOTYPE: PH).

Eragrostis sporoboloides J.G. Sm. & Bush, Annual Rep. Missouri Bot. Gard. 6:116, t. 54. 1895. TYPE: U.S.A. OKLAHOMA: Sapula, Indian Territory, Jul 1894, *B.F. Bush 766* (HOLOTYPE: ?).

Caespitose perennials with innovations and hardened bases, not glandular. Culms (30–)45–100 cm tall, erect, glabrous below the nodes; bud initiation usually intravaginal. Leaf sheaths overlapping, 1/2–1.5 times as long as the internodes below, rarely glabrous, apices and distal margins usually hairy, sometimes also densely hairy basally, dorsally, and on the collars, hairs to 6 mm long, papillose-based; ligules 0.2–0.4 mm long; blades 25–60 cm long, 4–8(–11) mm wide, flat to loosely involute, usually glabrous, adaxial surfaces sometimes hairy basally. Panicles 25–85 cm long, 15–40 cm wide, broadly ovate, open; primary branches mostly 4–35(–45) cm long, diverging 20–90° from the rachises, capillary; pulvini glabrous or hairy; pedicels 2–28 mm long, divergent. Spikelets 2–4(–5) mm long, 1–1.5 mm wide, lanceolate, greenish with purplish tinges, with 2–4 florets; disarticulation acropetal, paleas persistent; glumes lanceolate, hyaline to membranous; lower glumes 1.1–2 mm long; upper glumes 1.5–2.8 mm long, apices acuminate to acute; lemmas 1.6–2.4 mm long, ovate, membranous, hyaline near the margins, lateral veins inconspicuous, apices acute; paleas 1.2–2.2 mm long, hyaline, bases not projecting beyond the lemmas, apices acute to obtuse; stamens 3; anthers 0.3–0.8 mm long, purplish. Caryopses 0.8–1 mm long, rectangular-prismatic, somewhat laterally compressed, with or without a well-developed adaxial groove, striate, opaque, reddish-brown. $2n = 100$.

Distribution and habitat.—*Eragrostis hirsuta* is native to the Flora region and grows in sandy clay loams on the coastal plain and along roadsides, usually in association with *Pinus* and *Quercus*; 1–1750 m. Its range extends from

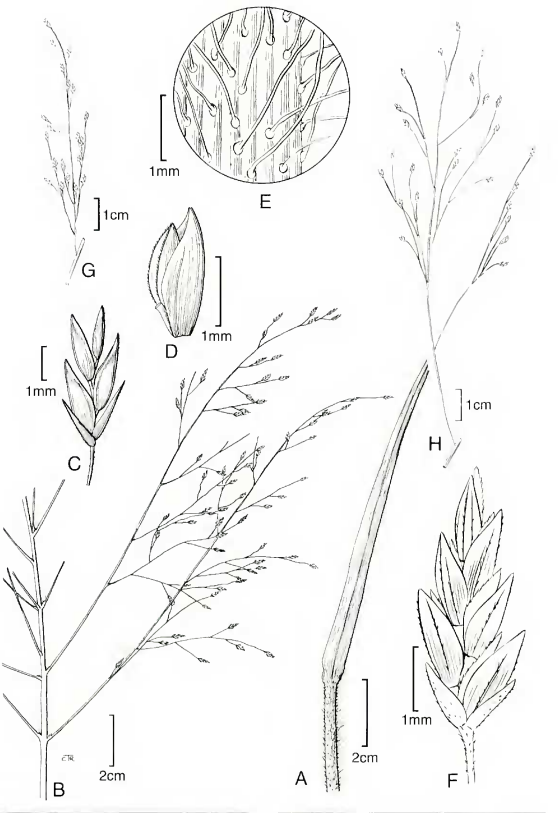

Fig. 8. *Eragrostis hirsuta*. **A.** Sheath and blade. **B.** Inflorescence. **C.** Spikelet. **D.** Floret. *Eragrostis hirta* var. *hirta*. **E.** Portion of the sheath. **F.** Spikelet. **G.** Primary panicle branch. *Eragrostis hirta* var. *longiramea*. **H.** Primary panicle branch.

the southeastern United States through eastern Mexico to Guatemala and Belize.

Comments.—*Eragrostis hirsuta* (along with *E. hirta*) is characterized by having papillose-based hairs near the apices and margins of the sheaths. The distinction between *E. hirsuta* and *E. hirta* is tentative and depends on the number of florets (2–4 in the former verses 4–7 in the latter), floret width (1–1.5 mm verses 1.4–2.0 mm), and floret color (greenish with a purplish tinge verses plumbeous to reddish-purple).

Specimens examined. **MÉXICO. Nuevo León:** Municipio de Bustamante, km 2 carretera Bustamante, *A. Bendeck s.n.* (ANSM). **Tamaulipas:** Municipio de Abasolo, Ejido La Esperanza, *J.F. Iribe-Duarte 48* (COCA); Municipio de Guémez, Ejido Los San Pedros, *G. Bores-Kulman 66* (COCA); Municipio de Hidalgo, El Chorrito, *G. Bores-Kulman 20* (COCA); Municipio de Jaumave, Sierra Madre rumbo a Jaumave, *J. Brito 43* (COCA); Municipio de Mainero, Adelante de Charco Dicha, Ejido Camarones, *M.H. Cervera-Rosado 359* (COCA); Municipio de Soto La Marina, Rancho El Saúz, *A. Brito 170* (COCA); Municipio de Victoria, Ejido Vicente Guerrero, *P. Moya-Salgado 139* (COCA); El Asbesto, *G. Bores-Kulman 80* (COCA).

10. Eragrostis hirta E. Fourn., Mexic. Pl. 2:115. 1886. TYPE: MEXÍCO. SAN LUIS POTOSÍ: Aug 1851, *Virlet de Aoust 1390* (HOLOTYPE: P!; ISOTYPE: US-773821 fragm. & photostat ex P!).

Eragrostis praetermissa L.H. Harv., Bull. Torrey Bot. Club 81:408. 1954. *Eragrostis intermedia* var *praetermissa* (L.H. Harv.) Witherspoon, Ann. Missouri Bot. Gard. 64:327. 1977. TYPE: GUATEMALA. BAJA VERAPAZ: Santa Rosa, Jul 1887, *H. von Tuerckheim 1292* (HOLOTYPE: US-821939!).

Caespitose perennials, with innovations. Culms 60–170 cm tall, erect or ascending, glabrous or hairy below the nodes, internodes mostly glabrous; bud initiation usually extravaginal. Leaf sheaths overlapping below, 2/3 the length of the internodes above, pilose along the margins and at the apices, hairs to 4 mm long, papillose-based; ligules 0.2–0.4 mm long; blades 20–65 cm long, 2–8(–9) mm wide, flat to loosely folded or involute, mostly glabrous, scabrous above, sometimes with papillose-pilose near the base, the hairs up to 5 mm long; margins scabrous. Panicles 26–70 cm long, 4–40 cm wide, somewhat condensed or open, ovate, elliptic to lanceolate, branches whorled below, solitary or opposite above; primary branches mostly 4–25 cm long below, appressed, ascending and spreading up to 80° from the rachises; pulvini glabrous or pilose; pedicels 2.5–15 mm long, erect, longer than the spikelets, glabrous. Spikelets 3–5.5 mm long, 1.4–2.0 mm wide, ovate to linear-ovate, plumbeous to reddish-purple, with 4–7 florets; disarticulation acropetal with deciduous glumes and lemmas; glumes lanceolate, keel scabridulous, apices acute; lower glumes 1–1.8 mm long; upper glumes 1.6–2.2 mm long; lemmas 1.6–2.2 mm long, ovate, membranous, glabrous or with a few scattered hairs along the margins, lateral veins inconspicuous, keels scabridulous towards apex, apices acute; paleas 1.5–2.0 mm long, membranous, keels scabridulous; stamens 3; anthers 0.5–0.8 mm long, purplish. Caryopses 0.6–0.9 mm long, rectangular-prismatic, laterally compressed, striate, adaxially grooved, reddish-brown.

Distribution and habitat.—*Eragrostis hirta* is native to the Flora region.

KEY TO THE VARIETIES OF *ERAGROSTIS HIRTA*

1. Panicles 26–45(–50) cm long, 4–10 cm wide, somewhat condensed; primary branches 4–10 cm long below, appressed to ascending spreading; leaf blades 2–5 mm wide, mostly involute; culms 60–100 cm tall _____ **10a. E. hirta var. hirta**
1. Panicles 50–70 cm long, 18–40 cm wide, open; primary branches 15–25 cm long below, ascending spreading to reflexed; leaf blades 4–8(–9) mm wide, flat or loosely folded; culms (95–)110–170 cm tall _____ **10b. E. hirta var. longiramea**

10a. Eragrostis hirta var. **hirta** (**Fig. 8, E–G**).

Culms 60–100 cm tall. Leaf blades 20–45 cm long, 2–5 mm wide, mostly involute. Panicles 26–45(–50) cm long, 4–10 cm wide, somewhat condensed; primary branches 4–10 cm long below, appressed to ascending spreading.

Distribution and habitat.—*Eragrostis hirta* var. *hirta* occurs in rocky of sandy soils in oak-pine forests and along ravines and streams; 0–2100 m.

Specimens examined. **MEXICO. Tamaulipas:** Municipio de Casas, Sierra de Tamaulipas, Santa Maria de Los Nogales, *F. Martinez-Martinez 1949* (TEX-LL), *2081* (TEX-LL, US); Municipio Nuevo Laredo, 3 km S of El Huisachal, Standford et al. 2115 (US); Municipio de Soto La Marina, Rancho Enramadas, *G. Villegas-Durán 499* (COCA); without Municipio, between Ciudad Victoria and Soto La Marina, *A.A. Beetle M-4437* (COCA).

10b. Eragrostis hirta var. **longiramea** (Swallen) Witherspoon, Ann. Missouri Bot. Gard. 64:328. 1977. (**Fig. 8, H**). *Eragrostis longiramea* Swallen, J. Wash. Acad. Sci. 21:437. 1931. TYPE: MÉXICO. TAMAULIPAS: Sierra de San Carlos, Pico del Diablo, vicinity of Marmolejo, 12 Aug 1930, *H.H. Bartlett 10910* (HOLOTYPE: US-1501524!; ISOTYPES: GH!, MICH!, US-1611156!, US-3160925!).

Culms (95–)110–170 cm tall. Leaf blades 25–64 cm long, 4–8(–9) mm wide, flat or loosely folded. Panicles 50–70 cm long, 18–40 cm wide, open; primary branches 15–25 cm long below, ascending spreading to reflexed.

Distribution and habitat.—*Eragrostis hirta* var. *longiramea* occurs in dry, rocky soils along oak forest borders and streams known only from Tamaulipas, Nuevo León, and San Luis Potosí; 50–2300 m.

Specimens examined. **MEXICO. Nuevo Leon:** Municipio de Galeana, Sierra Madre Oriental, Pablillo, *E.W. Pennell 170.33* (MEXU); Municipio de Garza Garcia, road to Chipinque Mesa, *I.K. Langman 2855* (MEXU, PH, US). **Tamaulipas:** Municipio de Casas, road to Rancho "Las Yucas" and Santa Maria de Los Nogales, *F. Martinez Martinez & G. Borja Luyando F. 1938* (TAES, US); Municipio de Soto La Marina, Ejido Verde Grande, *J.F. Tribe-Duarte 330* (COCA).

11. Eragrostis hypnoides (Lam.) Britton, Sterns & Poggenb., Prelim. Cat. 69. 1888. (**Fig. 9, A–C**). *Poa hypnoides* Lam., Tabl. Encycl. 1:185. 1791. *Megastachya hypnoides* (Lam.) P. Beauv., Ess. Agrostogr. 74, 167, 175. 1812. *Neeragrostis hypnoides* (Lam.) Bush, Trans. Acad. Sci. St. Louis 13:180. 1903. *Erosion hypnoides* (Lam.) Lunell, Amer. Midl. Naturalist 4:221. 1915. TYPE: Tropical America, *D. Richard s.n.* (HOLOTYPE: P-LAM!, ISOTYPES: BAA-1041!, NY fragm. ex P, US-2850742 fragm. ex P!).

Stoloniferous annuals, mat-forming, without innovations, without glands. Culms decumbent and rooting at the lower nodes, erect portion (2–)5–12(–20) cm tall, often branched, glabrous or hairy on the lower internodes. Leaf sheaths

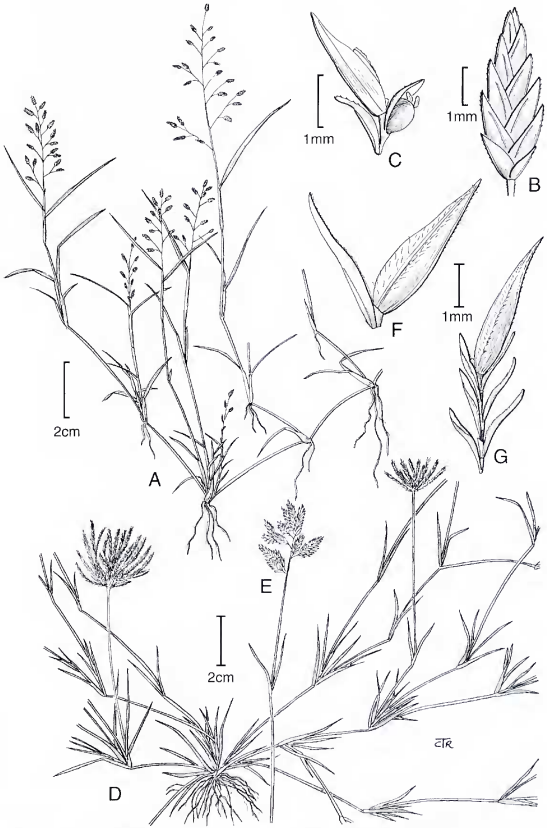

FIG. 9. *Eragrostis hypnoides*. **A.** Habit. **B.** Spikelet. **C.** Floret with two paleas below and caryopsis. *Eragrostis reptans*. **D.** Habit (female). **E.** Inflorescence (male) and culm. **F.** Floret (male) with palea below. **G.** Floret (female) with paleas below.

overlapping below, usually 1/3–1/2 as long as the internodes above, pilose on the margins, collars, and at the apices, hairs 0.1–0.6 mm long; ligules 0.3–0.6 mm long; blades 0.5–2.5 cm long, 1–2 mm wide, flat to involute, abaxial surfaces glabrous, adaxial surfaces appressed pubescent, hairs about 0.2 mm long. Panicles 1–3.5 cm long, 0.7–2.5 cm wide, terminal and axillary, ovate, open to somewhat congested; primary branches 0.1–0.5 cm long, appressed to strongly divergent, glabrous; pulvini sparsely pilose or glabrous; pedicels 0.2–1 mm long, ciliate. Spikelets 4–13 mm long, 1–1.5 mm wide, linear-oblong, often arcuate, loosely imbricate, greenish-yellow to purplish, with 12–35 florets; disarticulation acropetal, paleas persistent; glumes linear-lanceolate to lanceolate, hyaline; lower glumes 0.4–0.7 mm long; upper glumes 0.8–1.2 mm long; lemmas 1.4–2 mm long, ovate, strongly 3-veined, veins greenish, apices acuminate; paleas 0.7–1.2 mm long, hyaline, keels scabridulous, apices acute to obtuse; stamens 2; anthers 0.2–0.3 mm long, brownish. Caryopses 0.3–0.5 mm long, ellipsoid, somewhat translucent, light brown. $2n = 20$.

Distribution and habitat.—*Eragrostis hypnoides* grows along muddy or sandy shores of lakes and rivers and in moist, disturbed sites; 10–1600 m. It is native to the Americas, extending from southern Canada to Argentina.

Comments.—*Eragrostis hypnoides* is characterized by having a mat-like growth form only 5–20 cm tall with stoloniferous branches that root at the nodes. It is morphologically similar to *E. reptans* but differs by having bisexual florets and only two anthers 0.2–0.3 mm long.

Specimens examined **MÉXICO. Coahuila:** Municipio de Castaños, Presa Rodriguez, *E. Pérez-Torres* (COCA). **Nuevo León:** Municipio de Linares, Presa El Porvenir, *J.J. Ortiz-Diaz 8* (ANSM) **Tamaulipas:** Municipio de Aldama, km 15 carretera Estación Manuel-Aldama (Instituto Nacional de Investigaciones Forestales Agropecuarias y Pesqueras-Secretaria de Agricultura y Recursos Hidráulicos), *A. Brito s.n.* (UAT); Municipio de Soto La Marina, Chamal, *J.R. Swallen 1723* (US), Municipio de Tula, Joya de la Escondida, *G. Bores-Kulman 74* (COCA); Municipio de Victoria, area de la Torre de la Forestal, *J.G. Galván-Infante 307* (COCA).

12. Eragrostis intermedia Hitchc., J. Wash. Acad. Sci. 23:450. 1933. (**Fig. 10, A–C**). TYPE: U.S.A. TEXAS: Bexar Co., San Antonio, 3 Jul 1910, *A.S. Hitchcock 5491* (HOLOTYPE: US-1535749!; ISOTYPES: US-908993!, US-1535750!).

Caespitose perennials, with innovations, not glandular. Culms (30–)40–90(–110) cm tall, erect, glabrous below the nodes. Leaf sheaths overlapping, 1/2 to about as long as the internodes below, sparsely pilose on the margins, apices hairy, hairs to 8 mm long, not papillose-based; ligules 0.2–0.4 mm long; blades (4–) 10–20(–30) cm long, 1–3 mm wide, flat or involute, abaxial surfaces glabrous, adaxial surfaces densely hairy behind the ligules, elsewhere usually glabrous, occasionally sparsely hairy. Panicles 15–40 cm long, (8.5–)15–30 cm wide, ovate, open; primary branches 4–25 cm long, diverging 20–90° from the rachises, capillary; pulvini hairy or glabrous; pedicels 2–14 mm long, divergent. Spikelets 3-

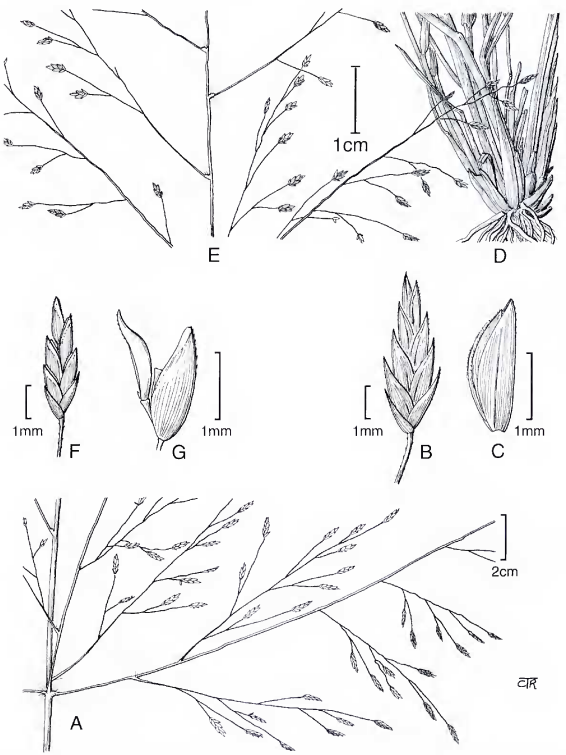

FIG. 10. *Eragrostis intermedia*. **A.** Inflorescence. **B.** Spikelet. **C.** Floret. *Eragrostis lugens*. **D.** Base of plant. **E.** Inflorescence. **F.** Spikelet. **G.** Floret with palea above.

7 mm long, 1–1.8 mm wide, narrowly lanceolate, olivaceous to purplish, with (3–)5–11 florets; disarticulation acropetal, paleas persistent; glumes lanceolate to ovate, hyaline to membranous; lower glumes 1.1–1.7 mm long, narrower than the upper glumes; upper glumes 1.3–2 mm long, apices acuminate to acute; lemmas 1.6–2.2 mm long, ovate, membranous, hyaline near the margins, lateral veins inconspicuous, apices acute; paleas 1.4–2.1 mm long, hyaline, narrower than the lemmas, apices obtuse to acute; stamens 3; anthers 0.5–0.8 mm long, purplish. Caryopses 0.5–1.0 mm long, rectangular-prismatic, somewhat laterally compressed, with a well-developed adaxial groove, striate, opaque, reddish-brown. $2n$ = ca. 54, 60, 72, ca. 74, 80, 100, 120.

Distribution and habitat.—*Eragrostis intermedia* is native to the Flora region and grows in clay, sandy, and rocky soils, often in disturbed sites; 0–2500 m. Its range extends from the United States through Mexico and Central America to South America. *Eragrostis intermedia* is similar to the more widespread *E. lugens*, but differs from that species in having wider spikelets, longer lemmas, and caryopses with a prominent adaxial groove.

Comments.—A numerical taxonomic study of the *Eragrostis intermedia* complex was completed by Witherspoon (1975) where he found much phenotypic overlap of individuals in his principal component and UPGMA cluster analyses of *E. intermedia* with *E. palmeri*, *E. erosa*, and *E. hirta*. Determination of these species is often problematic and examination of this group, which additionally includes *E. lugens* and *E. hirsuta*, is needed to clarify species boundaries. Presence or absence of papillose-based hairs near the apices and margins of the sheaths is the most reliable character to separate *E. hirta* and *E. hirsuta* from the others in this complex. Even though our key emphasizes the length of the lemma to separate *E. intermidia* (1.6–2.2 mm long), *E. erosa* (2.4–3 mm long), and *E. palmeri* (2–2.6 mm long), this character is somewhat variable in these species, and without the use of anther and caryopses length, it can be misleading. Our treatment is still very tentative and we encourage other agrostologists to investigate the evolutionary history within this group of species.

Specimens examined. **MEXICO. Coahuila:** Municipio de Acuña, Acuña, without collector (MEXU); near Santo Domingo, *L.E. Wynd & C.H. Mueller* (ANSM, US); Serranías del Burro, Rancho El Bonito in Cañón El Bonito, *J. Valdés-Reyna & D. H. Riskind 1232* (ANSM); Municipio de Allende, 13 mi SW of Ciudad Allende toward Sabinas, *M.C. Johnston & J. Graham 4175A* (MEXU); Municipio de Arteaga, 12 km S of Saltillo towards Matehuala, *M.A. Madrigal-A. s.n.* (MEXU); 17 mi SE of Saltillo and 7.4 mi NW of Jamé, *P.M. Peterson et al. 10075* (ANSM, US); suburb of Cerritos, NE of Saltillo, *P.M. Peterson et al. 10086* (US); Rancho El Carmen, *P. Moya-Salgado 437* (COCA); Sierra de Arteaga, Cañón de Jamé, 12 km E of Jamé, *J. Valdés-Reyna & M. A. Carranza P. 1930* (ANSM); Municipio de Castaños, 2 km SW of Restaurant La Muralla, *M.C. Johnston et al. 10282* (MEXU); La Muralla, carretera 57, Saltillo-Monclova, *J.A. Villarreal-Quintanilla et al. 4225* (ANSM); near Rancho Santa Teresa, S of Castaños, *L.E. Wynd & C.H. Mueller 200* (ANSM, US); Paso de San Lázaro, Sierra de la Gavia, 37.6 mi S of Monclova on Hwy 57, *P.M. Peterson et al. 9989* (ANSM, US); Rancho de Santa Teresa, S of Castaños, without collector (MEXU); Municipio de Cuatrociénegas, Sierra de San Marcos, Cañón Grande, Ejido Estanque de Norias,

M.A. Carranza-Pérez et al. 1715 (ANSM); Municipio de Múzquiz, 8 km SE of Palaú, *J. Valdés-Reyna 928, 949, 953* (ANSM); Las Rusias, Río Santa María, carretera Múzquiz-Boquillas del Carmen, 10 km NW of Múzquiz, *R. Vásquez-Aldape 226* (ANSM); 13.4 km NW of Muzquiz on Hwy 53 towards Boquilla del Carmen, *P.M. Peterson & C.R. Annable 10564* (US); 85.4 km NW of Muzquiz on Hwy 53 towards Boquilla del Carmen, *P.M. Peterson & C.R. Annable 10567* (US); 135.4 km NW of Muzquiz on Hwy 53 towards Boquilla del Carmen, *P.M. Peterson & C.R. Annable 10579* (US); Rancho La Peña, Sierra de Santa Rosa, *R.J.C. Martínez s.n.* (ANSM); Sierra La Encantada, 140 km N of Múzquiz at Flourita de México Unidad Minera, 6 km SW of the tunel, *M.A. Carranza-Pérez et al. 707* (ANSM); Municipio de Nava, 10 km W of Nava, *A. Rodríguez-Gámez 1031* (ANSM); Municipio de Ocampo, Sierra El Pino, 18.8 km SW of Rancho El Cimarron, *P.M. Peterson & C.R. Annable 10643* (US); Rancho La Rueda, 87 km NW of Ocampo, *J.A. Villarreal-Quintanilla et al. 3294* (ANSM); Municipio de Piedras Negras, 13 mi S of Piedras Negras, *F.W. Gould 11126* (US); Municipio de Progreso, 34 mi N of Monclova on Hwy 57, *P.M. Peterson & J. Valdés-Reyna 8378* (ANSM, MEXU, US); Municipio de Ramos Arizpe, El Cedral, Sierra de la Paila, *J.A. Villarreal-Quintanilla et al. 3626* (ANSM), *J.A. Villarreal-Quintanilla & M.A. Carranza P. 4806* (ANSM); Paso de San Lázaro, N of Ramos Arizpe on Hwy 57, @3 mi S of restaurante La Muralla, *P.M. Peterson & J. Valdés-Reyna 8356* (ANSM); Puerto de San Lázaro, Sierra de la Gavia, *J.A. Villarreal-Quintanilla et al. 3179* (ANSM); Sierra de la Paila, Ejido El Cedral camino hacia el Valle de Parreños, *J.A. Villarreal-Quintanilla 5384* (ANSM); Sierra de la Paila, Ejido El Cedral por el camino El Carmen, *J. Valdés-Reyna 2167a* (ANSM), *J.A. Villarreal-Quintanilla et al. 5324* (ANSM, MEXU); Municipio de Saltillo, 14 mi S of Saltillo, *F.A. Barkley et al. 7204* (MEXU); 8.5 km carretera Saltillo-Concepción del Oro, *J. Espinosa-Aburto 20* (ANSM), 6 km S of Saltillo; *P.M. Peterson & J. Valdés-Reyna 8345* (US); 0.8 km SE of Universdidad Autonoma Agraria "Antonio Narro", *P.M. Peterson & J. Valdés-Reyna 8350* (US); Buenavista, 7 km S of Saltillo on Hwy 54 towards Concepción del Oro, *J. Valdés-Reyna & M.A. Carranza P. 1124, 1892* (ANSM), *J.A. Villarreal-Quintanilla 1768* (ANSM), *J.A. Villarreal-Quintanilla & M.A. Carranza P. 1407* (ANSM); 0.3 km E of Hwy to Zacatecas up road to Canyon San Lorenzo, *P.M. Peterson & C.R. Annable 10551* (US); Cañón de San Lorenzo, en la Sierra de Zapalinamé, 8 km S de Saltillo, 3.2 km E de la Universidad Autónoma Agraria Antonio Narro, *R. López-Aguillón s.n.* (ANSM); Cerro del Pueblo, W of Ciudad Saltillo, *J. Valdés-Reyna et al. 2050* (ANSM); Lomas las Tetillas, *P. Moya-Salgado 414* (COCA); Poblado Los Ramones, *F. Alcalá-Ayala 20* (COCA); Rancho experimental Los Angeles, 48 km S of Saltillo on Hwy 54 towards Concepción del Oro, *J.S. Sierra-Tristán s.n.* (ANSM); Saltillo, *E. Palmer 408* (MEXU, US), *412* (MEXU), *A.S. Hitchcock 5597* (US), *G.L. Fisher 30011* (US); 1 mi S of Saltillo, *L.H. Harvey 8472* (US); 25 mi S of Saltillo, *L.H. Harvey 8736* (US); Sierra de Zapalinamé, frente al Cañón Boca Negra, *R. López-Aguillón s.n.* (ANSM); 7 mi N of Saltillo, *F.W. Gould 11198* (US); 5 km E of Saltillo (Las Palapas) up Camino de Quatro, *P.M. Peterson et al. 17859* (US).

Nuevo León: Municipio de Allende, 6.1 km S f Allende on Mex 85 towards Montemorelos, *P.M. Peterson & R.M. King 8338* (US); Municipio de Aramberri, Sierra La Lagunita, 9.5 mi SE of Aramberri on road towards Agua Fria, *P.M. Peterson et al. 16697* (US); Municipio de Cadereyta Jiménez, Cadereyta, *N. Bazaldua-Bazaldua 20* (COCA); Municipio de Galeana, Cañón de San Francisco, without collector (MEXU); 6 mi SE of Galeana, *J.R. Reeder & C.G. Reeder 4990* (US); El Peñuelo, *G. Villegas-Durán 206* (COCA); Cañón de San Francisco, 15 mi SW of Galeana, *C.H. Mueller & M.T. Mueller 1116* (MEXU); Municipio de General Zaragoza, 4 km S of Zaragoza at Junction of road to Cerro Viejo-Tepehuanes, *P.M. Peterson & J. Valdés-Reyna 15853* (US); 12 km al NE de la Encantada, *J.A. Villarreal-Quintanilla et al. 5132* (ANSM, MEXU); Sierra El Soldado, camino a San Antonio de Peña Nevada-Puerto Pinos, *J.A. Villarreal-Quintanilla et al. 4947* (ANSM); Municipio de Guadalupe, Guadalupe, *E. Cantú-Peña s.n.* (MEXU); Municipio de Iturbide, Ejido Santa Rosa, *E.A. Estrada-Castillón 1676* (ANSM); Municipio de Linares, 11 mi NW of Linares, *M.C. Johnston & J. Graham 4642* (MEXU); El Pinal-Las Palmas, *J.J. Ortiz-Díaz s.n.* (ANSM), Los Pinos, *J.J. Ortiz-Díaz s.n.* (ANSM); Rancho El Nogalar, *M.M. Castillo-Badillo 86-A* (COCA); Rancho La Loma, *P. Jauregui-Ramírez 14* (COCA); Rancho San José de los Hoyos, km 15 carretera Linares-Iturbide, *J. Garza-Covarrubias 21* (COCA); Municipio de Monterrey, Sierra

Madre mountains, *C.H. Mueller & M.T. Mueller 371-2-3* (MEXU); Municipio de Salinas Victoria, Cuesta de Mamulique, *J.S. Marroquín-de la Fuente 2836* (ANSM); La Soledad Salinas Victoria, *J.A. Ochoa-Guillemar 1129* (COCA); Municipio de Santiago, 9 km N of Los Cavazos, near Río San Juan, *I. Cabral-Cordero 76* (ANSM); Santiago, *P. Jauregui-Ramirez 47* (COCA); Ojos de Agua, *I. Cabral-Cordero 322* (ANSM); unknown Municipio, Dulces Nombres, *F.G. Meyer & D.J. Rogers 2557* (US). **Tamaulipas:** Municipio de Aldama, 16 km NW of Rancho El Coyote, *E. Martínez-Ojeda 247* (MEXU); Municipio de Casas, 64 km from Soto La Marina on the (old, winding) road to Casas a Victoria, *F.E. Martínez-Martínez & G. Borja L. 2360* (MEXU); Municipio de Cruillas, 4 km E de la carretera San Fernando-Victoria, desviación hacia Temascal, *R. Díaz-Pérez 259* (UAT); Municipio Hidalgo, 40 km W of Hwy 85 towards Dulce Nombres, *P.M. Peterson & J. Valdés-Reyna 15893* (US); Municipio de Matamoros, Palo Blanco, *H. LeSueur 653* (US); Municipio de Miquihuana, 2 km SW of Miquihuana, *A. Mora-Olivo 977* (UAT); Municipio de Palmillas, 887 km SW of Ciudad Victoria on Mex 101 towards San Luis Potosí, *P.M. Peterson & R.M. King 8331* (US); Ejido El Capulín, *M. Martínez Díaz de Salas 403* (UAT); Municipio de San Carlos, Piedra Imán, 2 km ESE of San José, *O.L. Briones-Villarreal 1211* (ANSM); Municipio de San Fernando, 23 mi from the San Fernando-Matamoros highway junction on the gravel road to Reynosa, *M.C. Johnston & J. Graham 4714A* (MEXU), Municipio de Tula, km 78 carretera Jaumave-Tula, *P. Moya-Salgado 171* (COCA); Municipio de Victoria, San Juan, *J.F. Tribe-Duarte 418, 421* (COCA); unknown Municipio, 5 km S of Hoja Verde, *Stanford et al. 2214* (US).

13. Eragrostis lehmanniana Nees, Fl. Afr. Austral. Ill. 402. 1841. (**Fig. 5, D & E**).
TYPE: SOUTH AFRICA: Cabo de Buena Esperanza, *J.F. Drège* s.n. (ISOTYPES: BM, LE)

Caespitose perennials, forming innovations at the basal nodes, without glands. Culms (20–)40–80 cm, erect, commonly geniculate, sometimes rooting at the lower nodes, glabrous, lower portions sometimes scabridulous. Leaf sheaths 1/3–2/3 the length of the internodes, sometimes shortly silky pilose basally, hairs less than 2 mm long, apices sparsely hairy, hairs to 3 mm long; ligules 0.3–0.5 mm long, ciliate; blades 2–12 cm long, 1–3 mm wide, flat to involute, glabrous, abaxial surfaces sometimes scabridulous, adaxial surfaces scabridulous. Panicles 7–18 cm long, 2–8 cm wide, oblong, open; primary branches 1–8 cm long, appressed or diverging to 40° from the rachises; pulvini glabrous; pedicels 0.5–4 mm long, diverging or appressed, flexible. Spikelets 5–12(–14) mm long, 0.8–1.2 mm wide, linear-lanceolate, plumbeous to stramineous, with 4–12(–14) florets; disarticulation irregular to basipetal, paleas usually persistent; glumes oblong to lanceolate, membranous; lower glumes 1–1.5 mm long; upper glumes 1.3–2 mm long; lemmas 1.5–1.7 mm long, ovate, membranous, lateral veins inconspicuous, apices acute to obtuse; paleas 1.4–1.7 mm long, obtuse; stamens 3; anthers 0.6–0.9 mm long, yellowish. Caryopses 0.6–0.8 mm long, ellipsoid to obovoid, dorsally compressed, sometimes with a shallow adaxial groove, smooth, translucent, mostly light brown, embryo region dark brown with a greenish ring, $2n = 40, 60$.

Distribution and habitat.—*Eragrostis lehmanniana* is introduced in the Flora region and native to southern Africa, where it grows in sandy, savannah habitats. In the Flora region, it grows in sandy flats, along roadsides, on calcareous slopes, and in disturbed areas; 1500–1830 m. It is commonly found in association with *Larrea tridentata, Opuntia, Quercus, Juniperus*, and *Bouteloua gracilis*.

Comments.—*Eragrostis lehmanniana* was introduced for erosion control in the southern United States, and now it often displaces native species throughout the New World.

Specimens examined. **MÉXICO. Coahuila:** Municipio de Ramos Arizpe, Estación Experimental Forestal Z. A. "La Sauceda", *J.A. De la Cruz-Breton s.n.* (MEXU); Ramos Arizpe, *R. Palomo-Garza s.n.* (ANSM); Municipio de Saltillo, Buenavista, 7 km S de Saltillo, carretera 54 Saltillo-Concepción del Oro, Zacatecas, *J. Valdés-Reyna & M. A. Carranza P. 912, 915, 1819* (ANSM); 6 km S de Saltillo, entrada a la Universidad Autonoma Agraria Antonio Narro, J. Valdés-Reyna 2337 (US). **Nuevo León:** Municipio de Galeana, Navidad, carretera 57, km 85 al N de Saltillo. *F. Cárdenas & M. A. Bernal s.n.* (MEXU).

14. Eragrostis lugens Nees, Fl. Bras. Enum. Pl. 2:505-506. 1829. (**Fig. 10, D–G**). *Poa lugens* (Nees) Kunth, Enum. Pl. 1:331. 1833. *Eragrostis pilosa* var. *lugens* (Nees) Griseb., Abh. Königl. Ges. Wiss. Göttingen 24:290. 1879. TYPE: URUGUAY: Montevideo, *F. Sellow s.n.* [LECTOTYPE: US-732957!, designated by Witherspoon (1975) and not effectively published, accepted by Davidse (1994), and clarified by Boechat & Longhi-Wagner (2001); ISOLECTOTYPES: B, BM?, BAA-2932].

Caespitose perennials, with innovations, not glandular. Culms (20–)30–50 (–60) cm tall, erect, sometimes geniculate, glabrous below the nodes. Leaf sheaths overlapping, 1/2–2/3 as long as the internodes above, mostly glabrous, apices hairy, hairs 2–5 mm long, papillose-based, this sometimes not readily seen; ligules 0.2–0.3 mm long; blades (4–)8–22 cm long, 1–3.5 mm wide, involute to flat, both surfaces glabrous, margins sometimes with scattered hairs, hairs to 7 mm long. Panicles 16–28 cm long, 10–21 cm wide, ovate, open; primary branches 0.6–15 cm, diverging up to 100° from the rachises, naked basally; pulvini hairy; pedicels 1.4–5(–7) mm long, diverging, wiry, present on all spikelets. Spikelets 2–4.5(–5) mm long, 0.5–1(–1.3) mm wide, narrowly lanceolate, plumbeous to reddish-purple, with 2–7 florets; disarticulation acropetal, paleas persistent; glumes broadly ovate to narrowly lanceolate, hyaline, sometimes reddish-purple; lower glumes 0.6–1 mm long; upper glumes 1.1–1.4 mm long, usually broader than the lower glumes; lemmas 1.2–1.6 mm long, broadly ovate, mostly membranous but the distal margins hyaline, lateral veins inconspicuous, apices acute; paleas 1.1–1.7 mm long, membranous to hyaline, apices obtuse; stamens 3; anthers 0.2–0.7 mm long, reddish-purple. Caryopses 0.5–0.6 mm long, obovoid to somewhat prism-shaped, terete to somewhat laterally compressed, with an adaxial groove, finely striate, usually opaque, faintly reddish-brown to whitish. $2n = 40, 80$, ca. 108.

Distribution and habitat.—*Eragrostis lugens* is native to the Flora region and grows in montane areas along roadsides and waste places; 0–2500 m. Its range extends from the southern United States to Peru and Argentina.

Specimens examined. **MÉXICO. Coahuila:** Municipio de Saltillo, Cañón El Cuatro, *J.A. García 24* (COCA). **Nuevo León:** Municipio de Aramberri, Sierra La Lagunita, 13.5 mi SE of Aramberri on road towards Agua Fria, *P.M. Peterson et al. 16712* (US); Municipio de Bustamante, Grutas de Bustamante, *P. Jauregui-Ramirez 74* (COCA); Municipio de Galeana, E slope of Cerro Potosí, *R.L. McGregor et al. 405*

(US); Municipio de General Zaragoza, Ejido Tepehuanes, *P.M. Peterson & J. Valdés-Reyna 15876* (US); Municipio de Linares, Rancho El Nogalar, *M.M. Castillo-Badillo 86* (COCA); Municipio de Montemorelos, between Montemorelos and Allende, *F.W. Gould 9823* (TAES), *A.A. Beetle M-630* (US); unknown Municipio, Dulces Nombres, *F.G. Meyer & D.J. Rogers 2573* (US); unknown Municipio, S of Monterrey, *T. Tatcoka 1094* (US). **Tamaulipas:** Municipio de Casas, Sierra de Tamaulipas, on road from Las Yucas towards Santa María de los Nogales, *F. Martínez-Martínez & G. Borja L. F 2006* (US); Municipio de Gómez Farías, El Julilo, *J.F. Iribe-Duarte 424* (COCA); Municipio de Guémez, El Chihue, *J.G. Galván-Infante 108* (COCA); Rancho Nuevo, *J.L. Ramos-Delgado 25* (COCA); Municipio de Hidalgo, Caballos, *G. Bores-Kulman 62* (COCA); Municipio de Méndez, San Tomás I, *J.A. Barrientos-B. 2* (COCA); Municipio de San Carlos, Sierra Chiquita, *G. Villegas-Durán 403* (COCA); Municipio de Soto La Marina, near San José de las Rusias, *J.A. Franco-López 60, 63* (COCA); Municipio de Tula, Ejido La Laguna, *P. Moya-Salgado 168* (COCA) Municipio de Victoria, Altas Cumbres, *M.H. Cervera-Rosado 474* (COCA); Camino a Altas Cumbres, Ejido El Huizachal, *J.G. Galván-Infante 336* (COCA); Camino al Molino, *J.F. López de la Cruz 26* (COCA); Carretera Victoria-Tula, *J.F. Iribe-Duarte 116* (COCA).

15. Eragrostis mexicana (Hornem.) Link subsp. **mexicana,** Hort. Berol. 1:190. 1827. (**Fig. 2, E–G**). *Poa mexicana* Hornem., Hort. Bot. Hafn. 2:953. 1815. TYPE: MÉXICO: Cultivated from seed collected in México, *Sessé s.n.* (SYNTYPE: MA). BRAZIL: *Sessé & M. Lacasta* (SYNTYPE: US-2891498 fragm!).

Eragrostis limbata E. Fourn., Mexic. Pl. 2:116. 1886. TYPE: MÉXICO. 1833, *A.J.A. Bonpland 4573* [LECTOTYPE: P, designated by McVaugh (1983) but a specific herbarium not indicated!; ISOLECTOTYPE: US-2941517 fragm!].

Eragrostis neomexicana Vasey ex L.H. Dewey, Contr. U.S. Natl. Herb. 2(3):542. 1894. TYPE: U.S.A. NEW MEXICO: Organ Mountains, 1881, *G. Vasey 474* [LECTOTYPE: US-1766311, designated by Koch and Sánchez-Vega (1985)!; ISOLECTOTYPES: K, US-822049!, US-900912!].

Caespitose annuals, without innovations. Culms 10–130 cm tall, erect, sometimes geniculate, glabrous, sometimes with a ring of glandular depressions below the nodes. Leaf sheaths 1/2–2/3 as long as the internodes, sometimes with glandular pits, pilose near the apices and on the collars, hairs to 4 mm long, papillose-based; ligules 0.2–0.5 mm long, ciliate; blades 5–25 cm long, 2–7(–9) mm wide, flat, abaxial surfaces glabrous, adaxial surfaces scabridulous, occasionally pubescent near the base. Panicles (5–)10–40 cm long, (2–)4–18 cm wide, less than 1/2 the height of the plant, ovate, rachises angled and channeled; primary branches 3–12(–15) cm, solitary to whorled, appressed or diverging to 80° from the rachises; secondary branches somewhat appressed; pulvini glabrous; pedicels 1–6(–7) mm long, almost appressed to narrowly divergent, stiff. Spikelets (4–)5–10(–11) mm long, 1.5–2.4 mm wide, ovate to oblong, gray-green to purplish, with 5–11(–15) florets; disarticulation acropetal; glumes subequal, 1.2–2.3 mm long, ovate to lanceolate, membranous; lemmas 1.2–2.4 mm long, ovate, membranous, glabrous or with a few hairs, gray-green, lateral veins evident, often greenish, apices acute; paleas 1–2.2 mm long, hyaline, keels scabrous, apices obtuse to truncate; stamens 3; anthers 0.2–0.5 mm long, purplish. Caryopses 0.5–0.8(–1) mm long, ovoid to rectangular-prismatic, laterally compressed, shallowly to deeply grooved on the adaxial surface, striate, reddish-brown, distal 2/3 opaque. $2n = 60$.

Distribution and habitat.—*Eragrostis mexicana* is native to the Flora region and grows along roadsides, near cultivated fields, and in disturbed open

areas; 100–3000 m. *Eragrostis mexicana* subsp. *mexicana* grows from Ontario through the midwestern United States to California, South Carolina, and Texas and southwards to México, Central America, and northern South America to Argentina (Sanchéz Vega & Koch 1988).

Comments.—We follow Koch and Sánchez-Vega (1985) in the placement of *E. neomexicana* as a synonym of *E. mexicana* subsp. *mexicana*.

Specimens examined. **MÉXICO. Coahuila:** Municipio de Acuña, El Jardin del Sur, *E.G. Marsh Jr 766* (MEXU); Municipio de Arteaga, Rancho El Carmen, *P. Moya-Salgado 438* (COCA); 1 mi SE of San Antonio de las Alazanas, *F.W. Gould & D. Watson 10512* (US); 14 mi SE of Saltillo, *J.R. Reeder & C.G. Reeder 3638* (US); Municipio de Parras, Parras de la Fuente, *W.A. Archer 3404, 3997* (US); Municipio de Ramos Arizpe, Ramos Arispe, *W.A. Archer 3401*; Sierra de la Paila (Lado Norte) Cañada Becerros, *J.A. Villarreal-Quintanillal & M. A. Carranza P. 5470A* (ANSM); Municipio de Saltillo, Buenavista, *J.O. Gutiérrez-Castillo*, s.n. (MEXU); Buenavista, 7 km S de Saltillo, carretera 54 Saltillo-Concepción del Oro, Zacatecas, *F.W. Gould & D. Watson 10498* (US), *A. Aznar-Ruiz* s.n. (ANSM), *J. Valdés-Reyna & M. A. Carranza P. 1120* (ANSM), *M.G. Villasenor* s.n. (ANSM), *J.S. Marroquin-de la Fuente* s.n. (ANSM), *J.A. Villarreal-Quintanilla & M. A. Carranza P. 1477* (ANSM), *J.A. Villarreal-Quintanilla 1691* (ANSM); Cañón de San Lorenzo, en la Sierra de Zapalinamé, 8 km S de Saltillo, 3.2 km E de la Universidad Autónoma Agraria Antonio Narro, *R. López-Aguillón* s.n. (ANSM), *R. López-Aguillón* s.n. (ANSM); Entrada del Cañón San Lorenzo, *R. López-Aguillón* s.n. (ANSM); Rancho experimental Los Angeles, 48 km S de Saltillo, carretera 54 Saltillo-Concepción del Oro, Zacatecas, *A. Aguirre-Sifuentes* s.n. (ANSM), *R. Gaytán-Gil* s.n. (ANSM); *J.A. Villarreal-Quintanilla et al. 6719* (ANSM), *C.E. Ruíz-Rocha* s.n. (ANSM); Saltillo, *G. Arsène 10630* (US), *A.S. Hitchcock 5629, 5642, 5643* (US), *E. Palmer 376* (US), *409* (MEXU, US), *410* (US), *411* (MEXU, US), *412* (US), *710* (US, MEXU); 27 mi SW of Saltillo, *E. Palmer 334, 335* (US); Universidad Autónoma Agraria Antonio Narro a 7 km al S de Saltillo, FM. *Cárdenas* s.n. (MEXU), *J. Valdés-Reyna 2336* (US); Vivero Forestal Secretaria de Agricultura y Recursos Hidraulicos, *F. Alcalá-Ayala 37, 68* (COCA); Municipio de Torreón, S of Torreón, canyon between Jimilco and Juan Eugenio, *P.M. Peterson & J. Valdés-Reyna 8475* (US); Torreón, *E. Palmer 510* (MEXU); Municipio de Zaragoza, Río San Rodrigo, @ 25 km N de la Cabecera Municipal, *A. Rodríguez-Gámez et al. 1234* (ANSM). **Nuevo León:** Municipio de Aramberri, Sierra La Lagunita, 13.5 mi SE of Aramberri on road towards Agua Fria, *P.M. Peterson et al. 16713* (US); 17 mi SE of Aramberri on road towards Agua Fria, *P.M. Peterson et al. 16725* (US); Municipio de Galeana, *V.H. Chase 7732* (US); 13 km S of the border of Coahuila and Nuevo León along highway 57, *S.L. Hatch et al. 4588* (ANSM); Carretera Galeana-Ascensión, a la altura del poblado Santa Fe, *N. Bazaldua-Bazaldua 101* (COCA); Cerro Potosi, 5 km W of Rancho 18 de Marzo (carretera to Galeana), *S.D. Koch & M. González L. 8629* (ANSM); Galeana, *V.H. Chase 7732* (ANSM); Municipio de General Zaragoza, 6 km S of Zaragoza on road towards Tepehuanes, *P.M. Peterson & J. Valdés-Reyna 15856* (US); 4 km W of Tepehuanes on road towards Zaragoza, *P.M. Peterson & J. Valdés-Reyna 15868* (US); Municipio de Santa Catarina, Cuesta de Los Muertos, carretera Monterrey-Saltillo, *R. Palomo-Garza* s.n. (ANSM); unknown Municipio, 32 mi S of San Roberto on Hwy 57, *R.L. McGregor et al. 494* (US). **Tamaulipas:** Municipio de Bustamante, Ejido Felipe Angeles 2 km NW of Bustamante, *R. Díaz-Pérez* (UAT); Municipio de González, Ejido Guadalupe Victoria, *G. Bores-Kulman 139* (COCA); Municipio de Jaumave, 7 km N of Magdaleno Aguilar (Santiaguillo) *F. González-Medrano et al. 9799* (MEXU); Municipio de Llera, La Gloria II, *J.E. López de la Cruz 154* (COCA); Municipio de Miquihuana, near Aserradero, *R.A. Carranco-Rendon 73* (COCA); Municipio de Tula, Ejido La Laguna, *J.F. Iribe-Duarte 122* (COCA); Municipio de Victoria, arca de la Torre de la Forestal, *J.G. Galván-Infante 330* (COCA).

16. Eragrostis obtusiflora (E. Fourn.) Scribn., Bull. Div. Agrostol. U.S.D.A. 8:10, t.5. 1897. (**Fig. 11, A–C**). *Brizopyrum obtusiflorum* E. Fourn., Mexic. Pl. 2:120. 1886. MÉXICO. VERACRUZ: Orizaba (in ora occidentali), *Émy* s.n. (HOLOTYPE: P!).

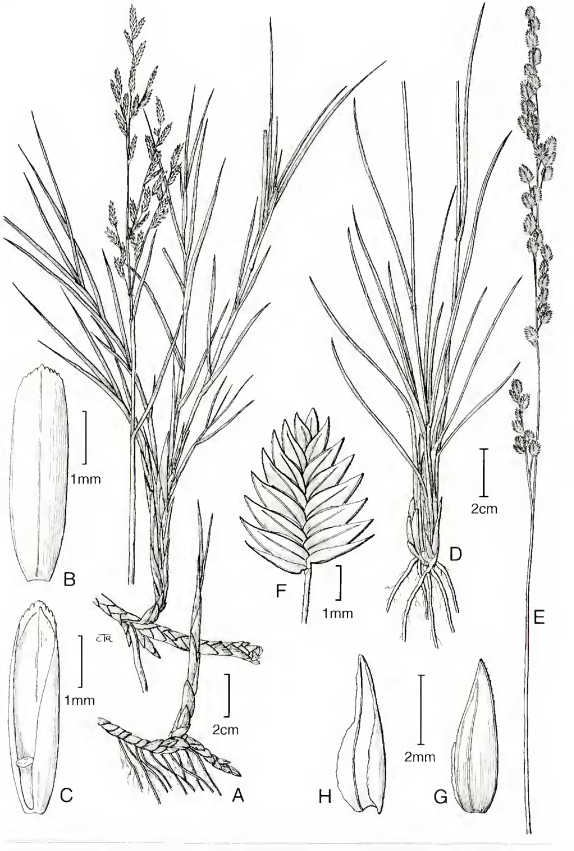

Fig. 11. *Eragrostis obtusiflora*. **A.** Habit. **B.** Floret, dorsal view. **C.** Floret, ventral view. *Eragrostis superba*. **D.** Base of plant. **E.** Inflorescence and upper culm. **F.** Spikelet. **G.** Lemma. **H.** Palea.

Perennials with scally, sharp-pointed rhizomes, with innovations, sometimes stoloniferous, the sharp-tipped rhizomes 4–8 mm thick. Culms 15–40(–50) cm tall, erect, stiff, hard, glaucus below the nodes. Leaf sheaths hairy at the apices, hairs to 2 mm long; ligules 0.2–0.4 mm long, membranous, ciliate; blades 2–15 cm long, (1–)2–4 mm wide, involute, arcuate, glabrous abaxially, scabrous adaxially, apices sharply pointed. Panicles 6–20(–24) cm long, 2–8(–12) cm wide, ovate, open or contracted; primary branches 1–8(–15) cm long, appressed or diverging up to 50° from the rachises; pulvini glabrous or not; pedicels 0–8 mm long, appressed, lower pedicels on each branch shorter than 1 mm long. Spikelets 8–14 mm long, 1.4–3 mm wide, ovate to lanceolate, stramineous with a reddish-purple tinge, with 5–10 florets; disarticulation basipetal, glumes persistent; glumes unequal, chartaceous; lower glumes 2.4–3.6 mm long; upper glumes 3–4.5 mm long, sometimes 3-veined; lemmas 3.8–4.5 mm long, ovate, leathery, 3–5-veined, lateral veins evident, greenish, upper margins hyaline, apices acute to obtuse, usually erose; paleas 3.8–4.5 mm long, membranous, keels scabridulous, apices obtuse to truncate; stamens 3; anthers 2–2.4 mm long, purplish to yellowish. Caryopses 1.6–2 mm long, ellipsoid, dorsally flattened, with a shallow adaxial groove, striate, reddish-brown. $2n = 40$.

Distribution and habitat.—*Eragrostis obtusiflora* is native to the southwestern United States and México. It grows in dry or wet alkali flats, often in association with *Distichlis* and *Sarcobatus*; 900–1400 m.

Comments.—*Eragrostis obtusiflora* was first described by Fournier (1886) in the genus *Brizopyrum* Link along with other species that are now included in *Distichlis* (*D. spicata* ssp. *stricta* Thorne), *Jouvea* [*J. pilosa* (J. Presl) Scribn.], and *Uniola* (*U. pittieri* Hack.). Ogden (1896) performed an anatomical survey of four grasses, *E. obtusiflora*, *Jouvea pilosa*, *J. straminea* E. Fourn., and *Distichlis spicata* (L.) Greene, all inhabitants of saline environments in southwestern North America. Ogden had originally thought that *E. obtusiflora* was conspecific with *Jouvea*. While all three of these species appear to be C_4 NAD-ME grasses, there are few unique anatomical features among each of these species. *Eragrostis obtusiflora* has a crown of colorless cells above each vein that separates it from the other three species. Even though Fournier (1886) and later Ogden (1896) noticed affinities of *E. obtusiflora* with *Distichlis*, *Jouvea*, and *Uniola*, all American agrostologists have followed Scribner's placement of this species in *Eragrostis*. Travis Columbus (per. comm.) has preliminary molecular sequence data that suggests *E. obtusiflora* is closely related to members of the Monanthochloinae that currently includes: *Distichlis*, *Monanthochloe*, and *Reederochloa* (Peterson et al. 2005).

Specimens examined. **MÉXICO. Coahuila:** Municipio de Ramos Arizpe, Predio La Esmeralda, *P. Moya-Salgado 440* (COCA); Municipio de Sierra Mojada, 80 (air) mi E of Saucillo, Chihuahua, W side of Laguna Jaco, *J. Henrickson 14202* (TEX-LL).

17. Eragrostis palmeri S. Watson, Proc. Amer. Acad. Arts 18:182. 1883. (**Fig. 7, D–G**). TYPE: MÉXICO. COAHUILA: Juárez, on the Sabinas River, Sep–Oct 1880, *E. Palmer 1368* (HOLOTYPE: GH; ISOTYPES: US-1761635, US-821984!).

Eragrostis caudata E. Fourn., Mexic. Pl. 2:115. 1886, nom. illeg. hom. TYPE: MÉXICO: Consoquitla, Aug 1841, *F.M. Liebmann 520* (SYNTYPES: C, US-2075433 fragm!); near Matamoras, Sep 1851, *J.L. Berlandier 2345* (SYNTYPES: MO-129490!, US-911405 fragm!, US-77390 fragm!).

Caespitose perennials, with innovations and knotty bases, not glandular. Culms 50–90(–120) cm tall, glabrous below the nodes. Leaf sheaths overlapping, 1/2 to about as long as the internodes below, villous and the hairs not papillose-based, or mostly glabrous, apices hairy, hairs to 5 mm long, not papillose-based; ligules 0.2–0.4 mm long; blades (14–)20–35 cm long, 1–2.4 mm wide, involute, abaxial surfaces glabrous, adaxial surfaces scabridulous, sometimes sparsely hairy. Panicles 12–40 cm long, 4–20 cm wide, oblong, open; primary branches 2–20 cm long, diverging 20–70° from the rachises, capillary; pulvini glabrous or sparsely hairy; pedicels (0.4–)1–4(–14) mm long, appressed or diverging, only the terminal pedicels on each branch longer than 4 mm. Spikelets 4–6(–7.3) mm long, 1–2 mm wide, linear-lanceolate, plumbeous, with 5–12 florets; disarticulation acropetal, paleas persistent; glumes lanceolate to ovate, hyaline; lower glumes 1.1–1.8 mm long; upper glumes 1.2–2.2 mm long, exceeded by the basal lemmas; lemmas 2–2.6 mm long, ovate, membranous, hyaline towards the apices and margins, keels weak or strong, without glands, lateral veins from inconspicuous to conspicuous, apices acute; paleas 1.7–2.4 mm long, hyaline, bases not projecting beyond the lemmas, apices truncate, often notched; stamens 3; anthers 0.6–1.3 mm long, yellowish to purplish. Caryopses 0.6–0.8 mm long, rectangular-prismatic to subellipsoid, laterally compressed, with a well-developed adaxial groove, faintly striate, opaque, reddish-brown. $2n = 40$.

Distribution and habitat.—*Eragrostis palmeri* is native to the Flora region and grows on rocky slopes and hills generally in association with *Pinus edulis*, *Juniperus monosperma*, *Bouteloua gracilis*, and *Prosopis*; 300–2150 m. Its range extends from the Oaxaca to the southwestern United States.

Specimens examined. **MEXICO. Coahuila:** Municipio de Canstaños, Paso de San Lázaro, Sierra de la Gavia, 37.6 mi S of Monclova on Hwy 57, *P.M. Peterson et al. 9981* (US); 15 mi S of Canstaños, *J.R. Reeder & C.G. Reeder 3953* (US); Municipio de Cuatrociénegas Cuatrociénegas, Sierra de la Madera, vicinity of 'La Cueva' in Corte Blanco fork of Charretera Canyon, *I.M. Johnston 9062* (MEXU, US); Municipio de Múzquiz, Rincon de Maria on Hacienda La Babia, *T.L. Wendt et al. 950* (MEXU); Sierra La Encantada, @170 km NW of Múzquiz, cuesta de Malena, *M.A. Carranza-Pérez et al. 836* (ANSM); Cuesta de Malena, 195 km NW of Múzquiz, *R. Vasquez-Aldape 229, 233* (ANSM); Municipio de Ocampo, Sierra El Pino, 9.6 km SW of Rancho El Cimarron, *P.M. Peterson & C.R. Annable 10636* (US); 39.5 km W of Rancho El Cimarron, *P.M. Peterson & C.R. Annable 10695* (US). Cuesta de Zozoya, @38 km de Ocampo rumbo a Sierra Mojada, *M.A. Carranza-Pérez & F.J. Carranza P. 669* (ANSM); Sierra del Pino, Ejido Acebuches, Cañón La Vaca, *M.A. Carranza-Pérez et al. 965* (ANSM MEXU); Municipio de Parras, 30 km W of General Cepeda on road towards Parras, *J. Valdés-Reyna & L.E. Rodriguez G. 1579* (ANSM), Municipio de Saltillo, 18 mi S of Saltillo on Hwy 54 and 1.3 mi W on road to microondas, *P.M. Peterson & M.A.*

Carranza P. 8424 (ANSM, US); 2 mi S of Saltillo, *F.W. Gould & D. Watson 10542* (US); unknown Municipio, 2 km N of Puerto Colorado near Aguaje del Pajarito, *I.M. Johnston 8676* (US). **Nuevo León:** Municipio de Aramberri, 3 mi NE of Dulce Nombres, *P.M. Peterson & J. Valdés-Reyna 15935* (US); Municipio de General Zaragoza, 6 km S of Zaragoza on road towards Tepehuanes, *P.M. Peterson & J. Valdés-Reyna 15862* (US); Municipio de Linares, 5 mi S of Linares toward Victoria, *M.C. Johnston & J. Graham 4647* (MEXU). **Tamaulipas:** Municipio de Aldama, between La Concepción and Aldama, *F. Martínez-Martínez & G. Borja L. F-2190, F-2192* (MEXU, US); Playa Barra del Tordo, *D. Baro-Peruyero et al. 392* (UAT); Municipio de Casas, 35 km from Victoria on the road to Casas and Soto La Marina, *F. Martínez-Martínez & G. Borja L. F-2334* (MEXU, US), *F-2339* (US); 64 km from Soto La Marina on the (old, winding) road to Casas a Victoria, *F.F. Martínez-Martínez & G. Borja L. 2358* (MEXU, US); Municipio de Hidalgo, 42 km W of Hwy 85 on road towards Dulce Nombres, *P.M. Peterson & J. Valdés-Reyna 15906* (US); Municipio de Palmillas, 11 mi S of Palmillas on road to Tula, *M.C. Johnston & J. Cruichfield 5632B, 5632C* (US); Municipio de Tula, 101.6 km SE of Ciudad Victoria on Mex 101 toward San Luis Potosí, *P.M. Peterson & R.M. King 8321* (US); unknown Municipio, Rio del Pilno, *V. Grant 513* (US); Hacienda Buena Vista, *E.O. Wooton s.n.* (US); 90 mi NW of Sabinas and 25 mi NW of Rancho Margareta, *F.W. Gould 10698* (US); 65 mi NW of Sabinas, near Rancho Margareta, *F.W. Gould 10641* (US).

18. Eragrostis pectinacea (Michx.) Nees, Fl. Afr. Austral. Ill. 406. 1841. *Poa pectinacea* Michx., Fl. Bor.-Amer. 1:69. 1803. *Eragrostis pectinacea* (Michx.) Steud., Syn. Pl. Glumac. 1:272. 1854, *isonym.* TYPE: U.S.A. ILLINOIS: *Michaux s.n.* (HOLOTYPE: P-MICH!; ISOTYPE: US-2851264 fragm. ex Pt).

Caespitose annuals, without innovations, without glandular pits. Culms 10–80 cm tall, erect to geniculate or decumbent below, glabrous. Leaf sheaths overlapping below, 1/2–3/4 as long as the internodes above, hirsute at the apices, hairs to 4 mm long; ligules 0.2–0.5 mm long; blades 2–20 cm long, 1–4.5 mm wide, flat to involute, abaxial surfaces glabrous and smooth, adaxial surfaces scabridulous. Panicles 5–25 cm long, 3–12(–15) cm wide, ovoid to pyramidal, usually open, sometimes contracted; primary branches 0.6–8.5 cm long, appressed or diverging to 80° from the rachises, solitary or paired at the lowest 2 nodes; pulvini glabrous or sparsely hairy; pedicels 1–7 mm long, flexible, appressed to widely divergent, sometimes capillary. Spikelets 3.5–11 mm long, 1.2–2.5 mm wide, linear-oblong to narrowly lanceolate, plumbeous, yellowish-brown, or dark reddish-purple, with 6–22 florets; disarticulation acropetal, paleas persistent; glumes subulate to ovate-lanceolate, hyaline; lower glumes 0.5–1.5 mm long, at least 1/2 as long as the adjacent lemmas; upper glumes 1–1.7 mm long, usually broader than the lower glumes; lemmas 1–2.2 mm long, ovate-lanceolate, hyaline to membranous, grayish-green proximally, reddish-purple distally, lateral veins moderately conspicuous, apices acute; paleas 1–2 mm long, hyaline to membranous, keels scabridulous, apices obtuse; stamens 3; anthers 0.2–0.4 mm long, purplish. Caryopses 0.5–1.1 mm long, pyriform, slightly laterally compressed, smooth, faintly striate, brownish. $2n = 60$.

Distribution and habitat.—*Eragrostis pectinacea* is native from southern Canada to Argentina. In the Flora region, it grows in disturbed sites such as roadsides, railroad embankments, gardens, and cultivated fields; 0–2400 m.

KEY TO THE VARIETIES OF *ERAGROSTIS PECTINACEA*

1. Pedicels appressed, rarely diverging to 20° from the rachises ____ **18a. E. pectinacea** var. **pectinacea**

1. Pedicels widely divergent, usually diverging 20–60° from the rachises ____ **18b. E. pectinacea** var. **miserrima**

18a. Eragrostis pectinacea (Michx.) Nees var. **pectinacea** (**Fig. 12, A–C**).

Eragrostis diffusa Buckley, Proc. Acad. Nat. Sci. Philadelphia 14:97. 1862. *Eragrostis purshii* var. *diffusa* (Buckley) Vasey, Contr. U.S. Natl. Herb. 1:59. 1890. TYPE: U.S.A. TEXAS: *S.B. Buckley* (LECTOTYPE: PH; ISOLECTOTYPE: US-91621, designated by Hitchcock, Man, Grasses U.S. 849. 1935 without citing a specific sheet or a specific herbarium!).

Pedicels appressed or diverging to 20° from the branch axes.

Distribution and habitat.—*Eragrostis pectinacea* var. *pectinacea* grows throughout the range of the species, including most of the states within México.

Specimens examined. **MEXICO. Coahuila:** Municipio de Cuatrociénegas, Sierra de San Marcos, áreas cercanas a la Poza de La Becerra, *A. Zarate-Lupercio 13* (ANSM), Sierra de San Marcos, Cañón Grande, Ejido Estanque de Norias, @43 km W of Hwy 57, *M.A. Carranza-Pérez et al. 1701* (ANSM); Municipio de Múzquiz, Sierra La Encantada, 140 km N de Múzquiz at Flourita de México Unidad Minera, *R. Vásquez-Aldape et al. 245* (ANSM); Sierra Maderas del Carmén, *E.A. Estrada-Castillón 1838, 1840* (ANSM); Municipio de Ocampo, Sierra de la Madera, Rancho Laguna de la Leche, @ 62 km from Ocampo, *M.A. Carranza-Pérez & E.J. Carranza-Pérez 619* (ANSM); Municipio de Ramos Arizpe, Campo experimental de Zonas Áridas La Sauceda, *J.S. Marroquín-de la Fuente 2999* (ANSM); Municipio de Saltillo, Buenavista, 7 km S de Saltillo, carretera 54 Saltillo-Concepción del Oro, Zacatecas, *J. Espinosa-Aburto 7* (ANSM); Rancho experimental Los Angeles, 48 km S de Saltillo, carretera 54 Saltillo-Concepción del Oro, Zacatecas, *J. Espinosa-Aburto 49* (ANSM), *J. Santos s.n.* (ANSM), *R. Vásquez-Aldape s.n.* (ANSM). **Nuevo León:** Municipio de Doctor Arroyo, La Chona, near Hwy 57, *P.M. Peterson et al. 17822* (US); Municipio de Galeana, km 63.6 carretera Galeana-San Roberto, *I. Cabral-Cordero 1086* (ANSM, MEXU); Municipio de Lampazos de Naranjo, Rancho El Campanero, 2 km NE de la casa, *O.L. Briones-Villarreal 238* (ANSM); Municipio de Linares, Las Palmas-El Pinal, *J.J. Ortiz-Díaz 9* (ANSM); Municipio de San Nicolás de los Garza, Ciudad Universitaria, *E.A. Jiménez-Valdés s.n.* (ANSM); Municipio de Santiago, 3 km N de Los Cavazos, *I. Cabral-Cordero 331* (ANSM). **Tamaulipas:** Municipio de Abasolo, 2 km from Ejido Morelos, *R. Díaz-Pérez 275* (UAT).

18b. Eragrostis pectinacea var. **miserrima** (E. Fourn.) Reeder, Phytologia 60:154. 1986. (**Fig. 12, D**). *Eragrostis parvula* Steud., Syn. Pl. Glumac. 1:277. 1854. *Eragrostis purshii* var. *miserrima* E. Fourn., Mexic. Pl. 2:116. 1886. TYPE: MÉXICO: M. Patreyss, 1845, *Parry 172* [LECTOTYPE: CN, designated as holotype by Koch (1974), ISOLECTOTYPE: US-797044 fragm!].

Eragrostis tephrosanthos Schult., Mant. 2:316. 1824. *Poa tephrosanthos* Spreng. ex Schult., Mant. 2:316. 1824, *nom. inval.* *Poa polymorpha* Sieber ex Schultes, Mant. 2:316. 1824, nom. inval. *Eragrostis purshii* var. *genuina* E. Fourn, *nom. inval.* TYPE: MARTINIQUE: *F.W. Sieber 33* (HOLOTYPE: M; ISOTYPES: K, MO-2011170!, P, US-1127056!, US-1127055!, W).

Eragrostis delicatula Trin., Mém. Acad. Imp. Sci. Saint-Petersbourg, Sér. 6, Sci. Math., Seconde Pt. Sci. Nat. 2(1):73. 1836. *Eragrostis pilosa* var. *delicatula* (Trin.) Hack., Anales Mus. Nac. Buenos Aires 11:133. 1904. TYPE: BRAZIL. In cultis prope Rio de Janeiro, May-Jun 1823, *L. Riedel* (HOLOTYPE: LE-TRIN-2330.01!; ISOTYPES: LE!, US-2891464 fragm!).

Eragrostis arida Hitchc., J. Wash. Acad. Sci. 23(10):449. 1933. *Eragrostis diffusa* var. *arida* (Hitchc.) Beetle, Phytologia 37:317. 1977. TYPE: U.S.A. TEXAS, Val Verde Co.: Del Rio, 14 Sep 1915, *A.S. Hitchcock 13650* (HOLOTYPE: US-905937!)

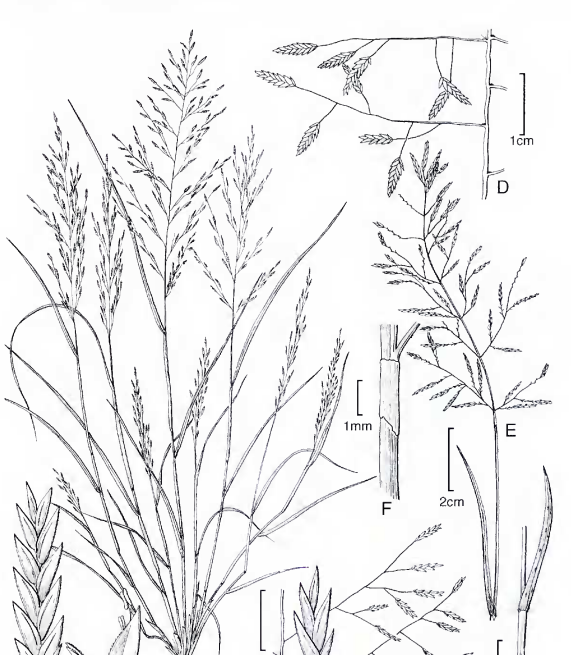

FIG. 12. *Eragrostis pectinacea* var. *pectinacea*. **A.** Habit. **B.** Spikelet. **C.** Florets, upper one with two exerted anthers and palea below. *Eragrostis pectinacea* var. *miserrima*. D. Inflorescence. *Eragrostis pilosa* var. *pilosa*. **E.** Inflorescence and upper culm with a blade. **F.** Rachis just below first inflorescence branch showing glandular band. **G.** Inflorescence. **H.** Spikelet. *Eragrostis pilosa* var. *perplexa*. **I.** Sheath and blade with glands. **J.** Portion of the blade with glands.

Pedicels widely divergent, usually spreading 20–60° from the branches.

Distribution and habitat.—*Eragrostis pectinacea* var. *miserrima* grows in the southern United States, from Texas to Florida, and south throughout México to the lowland tropics of Brazil.

Comments.—We follow Reeder (1986) in the placement of *E. arida*, *E. delicatula*, and *E. tephrosanthos* as synonyms of *E. pectinacea* var. *miserrima*.

Specimens examined. **MÉXICO. Coahuila:** Municipio de Arteaga, 1 mi SE of San Antonio de las Alazanas, *F.W. Gould & D. Watson 10513* (US); Municipio de Ramos Arizpe, El Cedral, Sierra de la Paila, *J.A. Villarreal-Quintanillal et al. 3630-3* (ANSM), Municipio de Saltillo, Buenavista, 7 km S de Saltillo, carretera 54 Saltillo-Concepción del Oro, Zacatecas, *J. Espinosa-Aburto 6* (ANSM); Saltillo, *E. Palmer 811, 812* (US), *A.S. Hitchcock 5621* (US). Municipio de Rastro, S de Saltillo, carretera 54 Saltillo-Concepción del Oro, Zacatecas, *J.F. Cano-Siller s.n.* (ANSM). **Nuevo León:** Municipio de Doctor Arroyo, Doctor Arroyo, *J.A. Ochoa-Guillemar 1279* (COCA); Municipio de Galeana, Galeana, *J.A. Ochoa-Guillemar 999* (COCA). **Tamaulipas:** Municipio de Jiménez, 10 km from Santander Jiménez on the road to San Fernando, *F.F. Martínez-Martínez & G. Borja L. 2458* (TEX-LL); Municipio de Jiménez, 6 mi N of Santander Jiménez, *M.C. Johnston 4906-B* (TEX-LL); Municipio de Matamoros, Santa Niño Aguanaval, *W.A. Archer 3408* (US); Municipio de Monclova, Monclova, *L.H. Harvey 1146* (US); Municipio de San Carlos, Cerro del Diente, *J.J. Barrientos-B. 92* (COCA); Municipio de Victoria, vicinity of Victoria, *E. Palmer 474, 555* (US), road to mountains W of Victoria, *J.R. Swallen 1625* (US); Municipio de Villagrán, 1 mi E Ejido San Lázaro, *M.C. Johnston & A.J. Graham 4299* (TEX-LL); unknown Municipio, Tampico to Tamaulipas, *J.L. Berlandier 24, 43* (US).

19. Eragrostis pilosa (L.) P. Beauv., Ess. Agrostogr. 71, 162, 175. 1812. *Poa pilosa* L., Sp. Pl. 1:68. 1753. TYPE: ITALY. 9–10 Aug 1902, *A. Kneucker, Gram. Exsicc. XII, 344* (EPITYPES: B, designated by H. Scholz in Cafferty et al., Taxon 49:256. 2000; US-5570511).

Poa eragrostis Walter, Fl. Carol. 80. 1788, nom. illeg. hom. TYPE: U.S.A. SOUTH CAROLINA.

Eragrostis filiformis Link, Hort. Berol. 1:191. 1827. *Poa linkii* Kunth, Révis. Gramin. 1:113. 1829. *Eragrostis linkii* (Kunth) Steud., Syn. Pl. Glumac. 1:273. 1854, nom. illeg. superfl. TYPE: America Boreali (ISOTYPE: US-91380 fragm. ex herb. Elliott!).

Caespitose annuals, without innovations. Culms 8–45(–70) cm tall, erect or geniculate, glabrous, occasionally with a few glandular depressions. Leaf sheaths overlapping below, about 1/2 as long as the internodes, mostly glabrous, occasionally glandular, apices hirsute, hairs to 3 mm long; ligules 0.1–0.3 mm long, ciliate; blades 2–15(–20) cm long, 1–2.5(–4) mm wide, flat, abaxial surfaces glabrous, occasionally with glandular pits along the midrib, adaxial surfaces scabridulous. Panicles 4–20(–28) cm long, 2–15(–18) cm wide, ellipsoid to ovoid, diffuse; primary branches 1–10 cm long, diverging 10–80°(–110°) from the rachises, capillary, whorled on the lowest 2 nodes, rarely glandular; pulvini glabrous or hairy; pedicels 1–10 mm long, flexible, appressed or divergent. Spikelets (2–)3.5–6(–10) mm long, 0.6–1.4 mm wide, linear-oblong to narrowly ovate, plumbeous, with (3–)5–17 florets; disarticulation acropetal, paleas tardily deciduous, rachillas persisting longer than the paleas; glumes narrowly ovate to lanceolate, hyaline; lower glumes 0.3–0.6(–0.8) mm long; upper glumes 0.7–1.2(–1.4) mm long; lemmas 1.2–2 mm long, ovate-lanceolate, membranous to hyaline, grayish-green proximally, reddish-purple distally; lateral veins inconspicuous, apices

acute; paleas 1–1.6 mm long, membranous to hyaline, keels scabridulous to scabrous, apices obtuse; stamens 3; anthers 0.2–0.3 mm long, purplish. Caryopses 0.5–1 mm long, obovoid to prism-shaped, adaxial surfaces flat, smooth to faintly striate, light brown. $2n = 40$.

KEY TO THE VARIETIES OF *ERAGROSTIS PILOSA*

1. Plants with numerous glandular pits scattered over the whole plant, especially on the midribs of the sheaths and blades; lemmas 1.8–2 mm long ——— **19a. E. pilosa** var. **perplexa**
1. Plants with a few glandular pits scattered on the culms or without any glandular pits; lemmas 1.2–1.8 mm long ——— **19b. E. pilosa** var. **pilosa**

19a. Eragrostis pilosa var. **perplexa** (L.H. Harv.) S.D. Koch, Illinois Biol. Monogr. 48:28. 1974. (**Fig. 12, I & J**). *Eragrostis perplexa* L.H. Harv., Bull. Torrey Bot. Club 81:409. 1954. TYPE: U.S.A. SOUTH DAKOTA, Mellette Co., 30 Aug 1935, *W.L. Tolstead s.n.* (HOLOTYPE: US-1645027; ISOTYPE: US-1649186!).

Culms with numerous glandular pits. Leaf sheaths with glandular pits; blades with glandular pits. Spikelets 0.6–1.4 mm wide; upper glumes 1–1.4 mm long; lemmas 1.8–2 mm long. Caryopses 0.8–1 mm long.

Distribution and habitat.—*Eragrostis pilosa* var. *perplexa* is a native variety known from widely scattered locations on moist soils in Wyoming, North Dakota, Nebraska, Colorado, northwestern Texas, and Tamaulipas; 10–300 m.

Specimens examined. **MÉXICO. Tamaulipas:** Municipio de Victoria, Camino a Santa Clara y Santa Rosa, *J.F. Iribe-Duarte 188* (COCA).

19b. Eragrostis pilosa var. **pilosa** (**Fig. 12E–H**).

Culms with few or no glandular pits. Leaf sheaths and blades without glandular pits. Spikelets 0.6–1.3 mm wide; upper glumes 0.7–1.2 mm long; lemmas 1.2–1.8 mm long. Caryopses 0.5–0.9 mm long.

Distribution and habitat.—*Eragrostis pilosa* var. *pilosa* is native to Eurasia but has become naturalized in many parts of the world. It is more common than *E. pilosa* var. *perplexa* in the Flora region and occurs along forest margins and disturbed sites such as roadsides, railroad embankments, gardens, and cultivated fields; 0–2100 m.

Specimens examined. **MÉXICO. Coahuila:** Municipio de Saltillo, Poblado Los Ramones, *E. Pérez-Torres 32* (COCA); Terrenos de la Secretaria de Agricultura y Recursos Hidráulicos, *M.E. Rodriguez-Moreno 16* (COCA); **Nuevo León:** Municipio de Galeana, km 63.6 carretera Galeana-San Roberto, *I. Cabral Cordero 1088* (ANSM); Municipio de Santiago, 4 km N of Los Cavazos, *I. Cabral-Cordero 219* (ANSM). **Tamaulipas:** Municipio de Gomez Farias, Cabecera *M.E. Crespo-Ovalle 109* (ANSM); Municipio de Llera, @30 mi S of Ciudad Victoria on Hwy 85, toward Ciudad Mante, *F.W. Gould 14820* (ANSM); Municipio de San Carlos, Cerro Bufa, El Diente, Sierra San Carlos, *O.L. Briones-Villarreal 1965* (ANSM); Municipio de Soto La Marina, Chamal, *J.R. Swallen 1695* (US); Municipio de Tula, Poblado El Pino, *G. Bores-Kulman 123* (COCA); Municipio de Villagrán, Garza Valdéz, *J.G. Galván-Infante 193* (COCA).

20. Eragrostis reptans (Michx.) Nees, Fl. Bras. Enum. Pl. 2:514. 1829. (**Fig. 9, D–G**). *Poa reptans* Michx., Fl. Bor.-Amer. 1:69–70, t. 11. 1803. *Poa dioica* Michx. ex Poir., Encycl.

5:87. 1804, *nom. inval. Megastachya reptans* (Michx.) P. Beauv., Ess. Agrostogr. 74, 167, 175. 1812. *Poa weigeltiana* Rchb. ex Trin., Mém. Acad. Imp. Sci. St.-Pétersbourg, Sér. 6, Sci. Math. 1(4):410. 1830, *nom. inval. Neeragrostis reptans* (Michx.) Nicora, Revista Argent. Agron. 29:5. 1963. TYPE: U.S.A. ILLINOIS: riviere Kaskaskia in limosis ripariis hujus amnii, *Michaux s.n.* (SYNTYPE: P-MICH!; ISOSYNTYPE: US-2767401 fragm.!).

Megastachya fasciculata E. Fourn., Mexic. Pl. 2:120. 1886. TYPE: MEXICO: Matamoros, *J.L. Berlandier 2325* (ISOTYPE: US-2821451 fragm!).

Neeragrostis weigeltiana Bush, Trans. Acad. Sci. St. Louis 13(7):178. 1903. *Eragrostis weigeltiana* Bush, Trans. Acad. Sci. St. Louis 13: 180. 1903, *nom. altern.* TYPE: SURINAM: 1827, *Weigelt s.n.* (ISOTYPE: MO-116197 fragm. ex herb. Bernhardi!).

Eragrostis capitata (Nutt.) Nash, Man. Fl. N. States 1042. 1901. *Poa capitata* Nutt., Trans. Amer. Philos. Soc., n.s., 5:146. 1835. TYPE: U.S.A. ARKANSAS: sand beaches of the Arkansas, *N. Nuttall s.n.* (ISOTYPE: US-2821449 fragm!).

Annuals; unisexual, pistillate and staminate plants morphologically similar; mat-forming, without innovations, without glands. Culms 5–20 cm tall, rooting at the lower nodes, erect or decumbent, glabrous, pilose, or villous, particularly below the panicles. Leaf sheaths mostly scabrous, margins sometimes with hairs 0.1–0.4 mm long; ligules 0.1–0.6 mm long; blades 1–4 cm long, 1–4.5 mm wide, flat or conduplicate, abaxial surfaces glabrous, adaxial surfaces appressed pubescent, hairs about 0.2 mm long. Panicles 1–3 cm long, 0.6–2.5 cm wide, terminal, ovate, contracted, exerted or partially included in the upper leaf sheaths, rachises somewhat viscid, pilose or glabrous; primary branches 0.5–1.5 cm long, appressed to the rachises, each terminating in a spikelet; pulvini sparsely pilose or glabrous; pedicels 0.2–2 mm long, shorter than the spikelets, glabrous or hairy. Spikelets 5–26 mm long, 1.5–4.7 mm wide, linear to ovate, greenish to stramineous, with 16–60 florets; disarticulation in the pistillate florets basipetal, the lemmas falling separately, staminate spikelets not or tardily disarticulating; glumes unequal, ovate, hyaline, glabrous or sparsely hirsute; lower glumes 0.8–1.6 mm long, 1-veined; upper glumes 1.5–2.5 mm long, 1–3-veined; lemmas (1.5–)1.8–4 mm long, ovate, hyaline to membranous, lateral veins conspicuous, greenish, apices acute to acuminate, sometimes prolonged into a mucro, mucros to 0.4 mm long; paleas 0.7–3.8 mm long, hyaline, about 1/2 as long as the lemmas in pistillate florets, as long as the lemmas in staminate florets, keels scabridulous; stamens 3; anthers 1.4–2.2 mm long, reddish to yellowish. Caryopses 0.4–0.6 mm long, ellipsoid, somewhat laterally compressed, smooth, light reddish-brown. $2n = 60$.

Distribution and habitat.—*Eragrostis reptans* is native to the Flora region and grows in wet sand, gravel, and clay soils along rivers and lake margins from southecentral United States to northeastern México, frequently with *Cynodon dactylon* and *Heliotropium*; 0–1350 m.

Comments.—*Eragrostis reptans* is unique among the species of *Eragrostis* in the Flora region because it is unisexual with male and female plants that can easily be mistaken for two separate species. The male plants have florets with

well developed anthers (1.4–2.2 mm long), lack caryopses, and have spikelets that are arranged in a loose panicle. The female plants have florets that lack stamens or have stamens with rudimentary anthers, develop mature caryopses, and have spikelets that are arranged in a tight panicle, at first glance appearing to be inserted digitately.

Specimens examined. **MÉXICO. Coahuila:** Municipio de Juárez, Presa Don Martín, *L.H. Harvey 927 & 929* (US), *F.W. Gould 11242* (TEX-LL), *Valdés-Reyna & L.E. Rodríguez G. 1926* (ANSM); Municipio de Progreso, 38 mi SE of Sabinas along Hwy 22, NE side of Venustiano Carranza Lake, *P.M. Peterson & J. Valdés-Reyna 8375* (ANSM, US). **Nuevo León:** 48 km S of Nuevo Laredo on road to Monterrey, *T.C. & E.M. Frye 2345* (US). **Tamaulipas:** Municipio de Matamoros, Ejido El Soliseño, *J. Cantú 32* (COCA).

21. Eragrostis secundiflora subsp. **oxylepis** (Torr.) S.D. Koch, Rhodora 80(823):397. 1978. (**Fig. 6, D & E**). *Poa interrupta* Nutt., Trans. Amer. Philos. Soc., n.s., 5:196. 1837, *nom. illeg. hom. Poa oxylepis* Torr., Explor. Red River Louisiana 301, t. 19. 1853. *Eragrostis oxylepis* (Torr.) Torr., Pacif. Railr. Rep. 4:156. 1857. *Megastachya oxylepis* (Torr.) E. Fourn., Mexic. Pl. 2:118. 1886. TYPE: U.S.A. ARKANSAS: near the sandy banks of the Arkansas River, *Nuttall s.n.* (HOLOTYPE: PH).

Caespitose perennials, with innovations, not glandular. Culms 30–75 cm tall, erect, glabrous below. Leaf sheaths overlapping below, 1/2 as long as the internodes above, mostly glabrous, hairy at the apices, hairs to 4 mm long; ligules 0.2–0.3 mm long; blades 10–25(–40) cm long, 1–5 mm wide, involute, glabrous abaxially, scabridulous adaxially, sometimes also sparsely pilose. Panicles (3–) 5–30 cm long, 1–15 cm wide, from narrowly oblong, glomerate, and interrupted below to ovate and open; primary branches 0.5–12(–16) cm, appressed or diverging up to 40° from the rachises, stiff; pulvini glabrous or sparsely hairy; pedicels 0–1(–3) mm, appressed, flattened. Spikelets 6–16(–23) cm long, 2.4–5 mm wide, ovate to linear-elliptic, flattened, stramineous, with reddish-purple margins or completely reddish-purple, with 10–45 florets; disarticulation basipetal, florets falling intact and before the glumes; glumes ovate-lanceolate to lanceolate, membranous; lower glumes 1.7–3 mm long; upper glumes 2.2–4 mm long, apices acuminate; lemmas 2–6 mm long, ovate, membranous to leathery, apices usually acuminate or attenuate, sometimes acute; paleas 1.5–3 mm long, membranous to leathery, narrower than the lemmas, apices obtuse, sometimes bifid; stamens 2; anthers 0.2–0.5 mm long, brownish. Caryopses 0.8–1.3 mm long, ellipsoid, somewhat laterally flattened, smooth, reddish-brown. $2n = 40$.

Distribution and habitat.—There are two subspecies of *E. secundiflora*; plants from the Flora region belong to *E. secundiflora* subsp. *oxylepis* (Torr.) S.D. Koch. It is native to the Flora region and grows in sandy soils, dunes, grasslands, beaches, and roadsides; 0–300 m. The range of *E. secundiflora* extends into southern United States.

Specimens examined. **MÉXICO. Tamaulipas:** Municipio de Abasolo, 2 km from Ejido Morelos, *R. Díaz-Pérez 272* (UAT); Municipio de Aldama, Playa Rancho Nuevo, *R. Díaz-Pérez 27* (ANSM, UAT); Rancho La Fortuna, *R. Sandoval-Hernández 39* (COCA); Rancho Nuevo, *J.L. Ramos-Delgado* (COCA); Rancho

Santa Rosa, *G. Bores-Kulman 6* (COCA); Barra del Tordo, *M.H. Cervera-Rosado 95* (COCA); Municipio de Altamira, Bocatoma, *Brigada de Dunas 695, 708* (COCA, MEXU); S of Lomas del Real, 7 mi N of main Hwy on dirt road just N of Altamira, *M.C. Johnston* (TEX-LL, US); Municipio de Ciudad Madera, Beach at Tampico, *A.A. Bettle M-534* (US); Municipio de Jiménez, Ejido Sor Juana Inés de la Cruz, *J.G. Galván-Infante 324* (COCA); Municipio de Matamoros, 7 km NW of Mezquital of road to Matamoros, *A. Mora-Olivo & J.L. Mora L. 5502* (MEXU, UAT); 25 km S of Playa Lauro Villar, *D. Baro-Peruyero et al. 257* (UAT); Playa Bagdad, 16 km N of Playa Lauro Villar, *D. Baro-Peruyero et al. 454* (UAT); Playa Lauro Villar, *A. Brito 58* (COCA); Municipio de Méndez, Rancho Guadalupe, *J.F. Iribe-Duarte 209* (COCA); Municipio de Nuevo Laredo, 30 km W of Nuevo Laredo, *without collector* (COCA); Laredo, *H. LeSueur 656* (US); Municipio de San Fernando, Carbonera, *R.A. Carranco-Rendon 379* (COCA); Municipio de Soto La Marina, Barra de Soto La Marina, E del Carrizo, *D. Baro-Peruyero et al. s.n.* (ANSM); Ejido Los Arroyos, *A. Brito 152* (COCA); Ex-Hacienda Santa Rosita, Rancho del Licenciado, *A. Mora-Olivo 592* (UAT); Marina Playa de La Pesca, *M. Alfaro s.n.* (UAT); Rancho San Alfonso, *J. Cantu 14* (COCA); 13 mi E of Abasolo turnoff on the Santander Jiménez-Pesca road, *J. Crutchfield 6141-A* (TEX-LL); 20 mi E of the San Fernando-Santander Jiménez Hwy on the road to Loreto, *J. Crutchfield 5541-BK* (TEX-LL); Papalote de la Micrandena, Rancho Loreto, *J. Crutchfield 5554-A* (TEX-LL); Municipio de Soto La Marina, Chamal, *J.R. Swallen 1661, 1689, 1740* (US); Municipio de Tampico, sand dunes, Tampico, *A.S. Hitchcock 5794* (US); unknown Municipio, Hacienda Buena Vista, *E.O. Wooton s.n.* (US).

22. Eragrostis sessilispica Buckley, Proc. Acad. Nat. Sci. Philadelphia 14:97. 1862. (**Fig. 13, A–C**). *Acamptoclados sessilispicus* (Buckley) Nash, Fl. S.E. U.S. 140. 1903. TYPE: U.S.A. TEXAS: near Austin, *Buckley s.n.* (LECTOTYPE: PH, designated by Hitchcock, Man. Grasses U.S. 852. 1935, but without citing a specific sheet in a specific herbarium).

Diplachne rigida Vasey, U.S.D.A. Div Bot. Bull. 12(2):t. 44. 1891. *Leptochloa rigida* Munro ex Vasey, U.S.D.A. Div. Bot. Bull. 12(2):t. 44. 1891. *Eragrostis rigida* (Vasey) Scribn., Proc. Acad. Nat. Sci. Philadelphia 43(2):304. 1891. *Rhabdochloa rigida* (Munro ex Vasey) Kuntze, Revis. Gen. Pl. 2:788. 1891. TYPE: U.S.A. TEXAS: *J. Reverchon 30* (HOLOTYPE: US-908831!).

Caespitose perennials, with innovations, not glandular. Culms 30–90 cm tall, erect or decumbent, glabrous below the nodes. Leaf sheaths overlapping below, 1/2 to as long as the internodes above, hairy at the apices and on the collars, sometimes also on the distal portion of the margins, hairs to 5 mm long; ligules 0.4–0.5 mm long; blades 5–30 cm long, 1–3 mm wide, usually involute, sometimes flat, abaxial surfaces glabrous or sparsely pilose, hairs to 5 mm long, adaxial surfaces scabridulous. Panicles 20–65 cm long, 10–35 cm wide, ovate, open; primary branches 2–20(–24) cm long, widely spaced, diverging 20–100° from the rachises, not rebranched, naked basally; pulvini hairy; pedicels 0–12 mm long, appressed, proximal spikelets on each branch sessile or subsessile, the pedicels shorter than 0.4 mm long. Spikelets 5–13 mm long, 1.4–3 mm wide, oblong to oblanceolate, stramineous to reddish-purple, with 3–12 florets; disarticulation tardy, basipetal, in the rachilla below the florets, glumes persistent; glumes lanceolate, broad basally, indurate; lower glumes 2.5–6 mm long; upper glumes 3–6 mm long, apices acuminate; lemmas 3–5 mm long, narrowly ovate to lanceolate, indurate, apices acuminate; paleas 2.4–4.6 mm long, indurate, gibbous basally but the sides not projecting beyond the lemmas, keels ciliolate, apices obtuse; stamens 3; anthers 0.3–0.5 mm long, reddish-brown. Caryopses

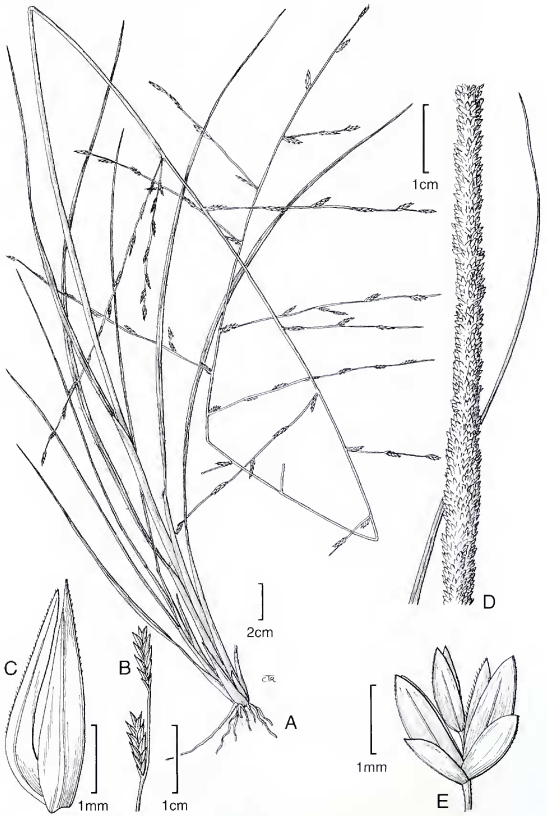

FIG. 13. *Eragrostis sessilispica*. **A.** Habit. **B.** Panicle branch with two spikelets. **C.** Floret. *Eragrostis spicata*. **D.** Inflorescence (portion) and blade. **E.** Spikelet.

0.9–1.5 mm long, ovoid to pyriform, laterally flattened, tapering distally, smooth to faintly striate, brownish. $2n = 40$.

Distribution and habitat.—*Eragrostis sessilispica* is native to the Flora region and grows in prairies, limestone mesas, thorn forest openings, and grasslands, generally in sandy soils, at 0–300 m, often in association with *Prosopsis* and *Quercus*. Its range extends into Texas, New Mexico, Oklahoma, and Kansas.

Comments.—*Eragrostis sessilispica* is characterized by having panicle branches that are not rebranched and sessile or subsessile spikelets on the lower portions of each branch.

Specimens examined. **MEXICO. Tamaulipas:** Municipio de Soto La Marina, Chamal, *J.R. Swallen 1739* (US-1502972); unknown Municipio, Buena Vista Hacienda, *E.O. Wooton s.n.* (US-1061799).

23. Eragrostis silveana Swallen, Amer. J. Bot. 19(5):438, f. 3. 1932. (**Fig. 4, C & D**).
TYPE: U.S.A. TEXAS: Bexar Co.: 1–31 Oct 1931, *W.A. Silveus 360* (HOLOTYPE: US-1501596!; ISOTYPES, US-1501597!, US-1501598!, US-1501599!, US-1501600!).

Caespitose perennials, with innovations and short, knotty rhizomes less than 4 mm thick. Culms 45–60 cm tall, erect, often glandular below the nodes, sometimes viscid. Leaf sheaths overlapping, 1–2 times as long as the internodes, often viscid, sometimes sparsely pilose, hairy at the apices, hairs to 6 mm long; ligules 0.2–0.3 mm long; blades 8–25 cm long, 2–4 mm wide, flat to involute, glabrous, sometimes viscid. Panicles 20–35(–42) cm long, 10–22 cm wide, broadly ovate, open, bases included in the uppermost leaf sheaths; primary branches 5–14 cm long, diverging 20–90° from the rachises, capillary, sometimes viscid, naked basally; pulvini hairy, hairs to 6 mm long; pedicels (1–)1.5–12 mm, diverging or appressed. Spikelets (2.5–)3–4.8 mm long, 0.9–1.4 mm wide, linear-lanceolate, reddish-purple, with 4–9 florets; disarticulation basipetal, glumes persistent; glumes lanceolate, membranous; lower glumes 0.9–1.2 mm long; upper glumes 1–1.3 mm long; lemmas 1.1–1.4 mm long, ovate to lanceolate, membranous, lateral veins conspicuous, apices acute; paleas 1–1.4 mm long, hyaline, not wider than the lemmas, apices obtuse; stamens 3; anthers 0.2–0.3 mm long, purplish. Caryopses 0.5–0.6 mm long, ellipsoid, terete in cross section, neither ridged nor grooved, faintly striate, reddish-brown.

Distribution and habitat.—*Eragrostis silveana* is native to the Flora region and grows in various open habitats, from sandy prairies to clay loam flats, near roadsides, railroads, and fields; 0–1310 m. Its range is limited to the coastal plain of Texas and higher plains of eastern México.

Comments.—Morphologically, *E. silveana* is somewhat intermediate between *E. spectabilis* and *E. curtipedicellata*, and grows where the distribution of these two species overlaps. *Eragrostis silveana* can be separated from *E. curtipedicellata* by having long pedicels (1.5–12 mm long in the former verses 0.2–1.2 mm long in the latter), shorter lemmas (1.1–1.4 mm long verses 1.5–2.2 mm long), and shorter caryopses (0.5–0.6 mm long verses 0.6–0.8 mm long).

Eragrostis silveana differs from *E. spectabilis* by having viscid to glandular sheaths or blades, terete caryopses, and leathery lemmas.

Specimens examined. **MÉXICO. Nuevo León:** Municipio de Linares, 11 mi N of Linares, *M.C. Johnston & A.J. Graham 4642* (TEX-LL). **Tamaulipas:** Municipio de Casas, 64 km from Soto La Marina towards Casas and Victoria, *F. Martinez Martinez & G. Borja Luyando F-2360* (TEX-LL, US), 35 km from Victoria on road to Soto La Marina, *F. Martinez Martinez & G. Borja Luyando F-2336* (US); Municipio de Jaumave, 4 mi S of Jaumave, *Stanford, Lauber & Tayler 2318* (US); Municipio de Llera, 26 mi S of Ciudad Mante on Hwy 85, *L.H. Harvey & T.J. Witherspoon 9220* (TEX-LL, US); Chamal, *J.R. Swallen 1645, 1674, 1687, 1704* (US).

24. Eragrostis spectabilis (Pursh) Steud., Nomencl. Bot. (ed. 2) 1:564. 1840. (**Fig. 1, C–E**). *Poa amabilis* Walter, Fl. Carol. 80. 1788, nom. illeg. hom. *Poa spectabilis* Pursh, Fl. Amer. Sept. 1:81. 1814. *Megastachya spectabilis* (Pursh) Roem. & Schult., Syst. Veg. 2:589. 1817. *Poa hirsuta* var. *spectabilis* (Pursh) Torr., Fl. N. Middle United States 1(1):114. 1823. *Eragrostis pectinacea* var. *spectabilis* (Pursh) A. Gray, Manual (ed. 2) 565. 1856. *Erochloe spectabilis* (Pursh) Raf. ex B.D. Jacks., Index Kew. 1:886. 1893. TYPE: U.S.A. SOUTH CAROLINA: *Clayton 580* (ISOTYPE: US-2891488 fragm!).

Eragrostis geyeri Steud., Syn. Pl. Glumac. 1:272. 1854. *Poa pectinacea* Geyer ex Steud., Syn. Pl. Glumac. 1:272. 1854, hom. illeg. et nom. inval. TYPE: U.S.A. ILLINOIS: *C.A. Geyer s.n.* (ISOTYPE: US-2891474 fragm!).

Eragrostis spectabilis var. *sparsihirsuta* Farw., Amer. Midl. Naturalist 10:306. 1927. TYPE: U.S.A. MICHIGAN.

Eragrostis velutina Schrad., Linnaea 12:451. 1838. *Poa villosa* Beyr. ex Schrad., Linnaea 12(4):451. 1838, *nom. inval.* TYPE: U.S.A. CAROLINA: *Beyrich s.n.*

Caespitose perennials, with innovations and short, knotty rhizomes less than 4 mm thick. Culms 30–70(–85) cm tall, erect to ascending, often sprawling, glabrous. Leaf sheaths overlapping, hairy on the margins and at the apices, hairs to 7 mm long; ligules 0.1–0.2 mm long; blades 10–32 cm long, 3–8 mm wide, flat to involute, both surfaces usually pilose, sometimes glabrous on both surfaces or glabrous abaxially and sparsely pilose adaxially, often with a line of hairs behind the ligules, hairs to 8 mm long. Panicles (15–)25–45(–60) cm long, 15–35 cm wide, broadly ovate to oblong, open, basal portions sometimes included in the uppermost leaf sheaths; primary branches (6–)12–20 cm long, diverging 20–90° from the rachises, capillary, naked below; pulvini hairy, hairs to 6 mm long; pedicels 1.5–17 mm long, divergent or appressed. Spikelets 3–7.5 mm long, 1–2 mm wide, linear-lanceolate, reddish-purple, sometimes olivaceous, with (4–)6–12 florets; disarticulation basipetal, glumes persistent; glumes (1–)1.3–2.3 mm long, subequal to equal, lanceolate, membranous to chartaceous; lemmas (1–)1.3–2.5 mm long, ovate to lanceolate, leathery, 3-veined, apices acute; paleas (1–)1.2–2.4 mm long, membranous, keels sometimes shortly ciliate, apices obtuse to truncate; stamens 3; anthers 0.3–0.5 mm long, purplish. Caryopses 0.6–0.8 mm long, ellipsoid, strongly flattened, adaxial surfaces with 2 prominent ridges separated by a groove, reddish-brown. $2n = 20, 40, 42$.

Distribution and habitat.—*Eragrostis spectabilis* is native in the Flora region, extending from southern Canada through the United States, México, and Belize.

It grows in fields and on the margins of woods, along roadsides, and in other disturbed sites, usually in sandy to clay loam soils, and is associated with hardwood forests, *Prosopsis-Acacia* grasslands, and shortgrass prairies; 0–1000 m.

Comments.—A showy species, *E. spectabilis* is available commercially for planting as an ornamental.

Specimens examined. **MÉXICO. Coahuila:** Municipio de Nava, Río Grande Valley, just N of Río Escondido, 18 km SW of Piedras Negras on México Hwy 57, *H.H. Iltis & A. Lasseigne 16* (COCA); Municipio de Saltillo 18 km W of Saltillo, *A.A. Beetle M-418* (COCA). **Nuevo León:** Municipio de General Bravo, General Bravo, *J.A. Ochoa-Guillemar 1166* (COCA); Municipio de Linares, Cañón Los Pinos, *T.S.P. s/n* (ANSM); without Municipio, Lampazos-Bustamante, *J.A. Ochoa-Guillemar 1224* (COCA). **Tamaulipas:** Municipio de Aldama, Ejido Lauro Aguirre, *P. Moya-Salgado 253* (COCA); km 10 a Barra del Tordo, *M.H. Cervera-Rosado 30* (COCA); Municipio de Casas, Predio González, *M.H. Cervera-Rosado 303* (COCA); Municipio de Victoria, Colonia La Estrella, Ciudad Victoria, *M. Cisneros 52* (COCA).

25. Eragrostis spicata Vasey, Bot. Gaz. 16(5):146. 1891. (**Fig. 13, D & E**). TYPE: MÉXICO. BAJA CALIFORNIA SUR: San José del Cabo, 12 Sep 1890, *T.S. Brandegee 10* (HOLOTYPE: US-1761638!).

Sporobolus tenuispica Hack., Repert. Spec. Nov. Regni Veg. 6(21–26):344. 1909. TYPE: PARAGUAY. GRAN CHACO: Pilcomayo, Jun, *T. Rojas 258* (HOLOTYPE: W; ISOTYPES: BAA-2931 fragm. ex herb. Hassler; US-2891485 fragm!).

Caespitose perennials, with innovations. Culms 75–100 cm tall, erect, glabrous. Leaf sheaths overlapping, about as long as the internodes above, hirtellous on the margins when immature, apices glabrous or hairy, the hairs shorter than 0.5 mm long; ligules 0.2–0.3 mm long; blades 20–40 cm long, 2–5(–6) mm wide, flat to involute, glabrous abaxially, scabrous adaxially. Panicles 22–40 cm long, 0.3–0.6 cm wide, spike-like, dense; primary branches shorter than 1.2 cm long, closely appressed, spikelet-bearing to the base; pulvini glabrous; pedicels 0.1–0.6 mm long, mostly appressed, hirtellous. Spikelets 1.4–2.2 mm long, 0.9–1.2 mm wide, ovate, stramineous to light greenish, with 2 or 3 florets; disarticulation basipetal, in the rachilla below the individual florets or at the base of the florets, glumes persistent; glumes elliptic to ovate, hyaline, keels ciliolate; lower glumes 0.7–1 mm long; upper glumes 0.9–1.3 mm long, apices obtuse; lemmas 1.5–2.1 mm long, ovate, membranous to hyaline, apices acute to obtuse; paleas 1.1–1.6 mm long, hyaline, not wider than the lemmas, apices obtuse; stamens 2; anthers 0.3–0.4 mm long, reddish-brown. Caryopses 0.7–1 mm long, ellipsoid, somewhat ventrally flattened, smooth to faintly striate, reddish-brown. $2n = 40$.

Distribution and habitat.—*Eragrostis spicata* is native to the Flora region and grows in moist areas in prairies, usually in deep, sandy, clay loam soils; 0–130 m. It is native from southern Texas to México and also found in Paraguay and Argentina. In North America, *E. spicata* grows with *Andropogon*, *Quercus stellata*, *Prosopsis glandulosa*, and *Acacia*.

Comments.—*Eragrostis spicata* is characterized by having a spike-like, narrow panicle (0.3–0.6 mm wide) with short closely appressed branches and 2- or 3-flowered spikelets.

Specimens examined. **MÉXICO. Tamaulipas:** Municipio de San Fernando, 23 mi from San Fernando-Matamoros Hwy, at Junction of road to Reynosa. *M.C. Johnston & A.J. Graham 4714* (TEX-LL); near Santa Teresa, 50 mi S of Matamoros. *M.C. Johnston & J. Crutchfield 5495* (TEX-LL, US); Municipio de Tampico, Tampico, *M.A. Madrigal-A. s.n.* (ANSM).

26. Eragrostis superba Peyr., Sitzungsber. Kaiserl. Akad. Wiss., Math.-Naturwiss. Cl. 38:584. 1860. (**Fig. 11, D–H**). TYPE: ANGOLA. Benguela, *Wawra 244* (HOLOTYPE: W).

Caespitose perennials, with innovations, without glands. Culms 45–95 cm tall, erect, glabrous. Leaf sheaths overlapping below, 1/3–1/2 the length of the internodes above, hairy at the apices and on the margins, hairs to 6 mm long; ligules 0.5–1.2 mm long; blades 7–30 cm long, 2.5–7 mm wide, flat to loosely involute, glabrous abaxially, scabrous adaxially, margins sharply scabrous. Panicles 10–30 cm long, 1–6 cm wide, oblong, condensed, interrupted below; primary branches 1–11 cm long, appressed or diverging to 40° from the rachises, naked basally; pulvini glabrous; pedicels 0.5–25 mm long, with a narrow band or abscission line below the apices. Spikelets 5.5–16 mm long, 2.7–9 mm wide, ovate, flattened, greenish to stramineous, sometimes with a reddish-purple tinge, with 4–22 florets; disarticulation below the glumes, spikelets falling intact; glumes equal, 3–4.5 mm long, ovate, chartaceous; lemmas 3–5 mm long, broadly lanceolate, chartaceous to leathery, lateral veins green, apices acute; paleas 3–5 mm long, chartaceous to hyaline, keels broadly winged below, forming a wing or tooth on each side that often projects beyond the lemma bases, apices acuminate; stamens 3; anthers 1.4–2.8 mm long, golden-yellow. Caryopses 1–2 mm long, ellipsoid, adaxial surfaces flattened, reddish-brown. $2n = 40$.

Distribution and habitat.—*Eragrostis superba* is introduced to the Flora region and native to Africa, where it is grown for hay, being fairly palatable and drought resistant. It is also used for erosion control and re-vegetation. In the Flora region, *E. superba* grows on rocky slopes, in sandy flats, and along roadsides, often with *Acacia, Prosopsis, Fouquieria splendens, Juniperus*, and *Quercus*; 480–1900 m.

Comments.—In addition to having very large spikelets (5.5–16 mm long and 2.7–9 mm wide), *Eragrostis superba* has winged paleas that often project beyond the lemmas when viewed laterally.

Specimens examined. **MÉXICO. Coahuila:** Municipio de Ramos Arizpe, Campo experimental de Zonas Áridas La Sauceda, *L. Luan-Olague s.n.* (ANSM); Municipio de Saltillo, Buenavista, 7 km S de Saltillo. *Valdés-Reyna s.n.* (ANSM); Cañón de San Lorenzo, 5 km de Saltillo hacia Zacatecas, *M.A. Madrigal-A. s.n.* (MEXU). **Tamaulipas:** Municipio de Llera, La Angostura, Llera-Victoria, *J.F. Iribe-Duarte 376* (COCA).

EXCLUDED SPECIES

Eragrostis swallenii Hitchc. has been reported from the Flora region (Beetle et al. 1991; Espejo-Serna et al. 2000), but no specimens supporting its presence have been located.

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REFERENCES

Amarasinghe, V. and L. Watson. 1990. Taxonomic significance of microhair morphology in the genus *Eragrostis* Beauv. (Poaceae). Taxon 39:59–65.

Beetle, A.A. E. Manrique Forceck, J.A. Miranda Sánchez, V. Jaramillio Luque, A. Chimal Hernández, and A.M. Rodríguez Rodríguez. 1991. *Eragrostis* V. Wolf. In: Las Gramineas de Mexico, Tomo III. COTECOCA, S.A.R.H., México, DF., México. Pp. 50–97.

Boechat, S.C. and H.M. Longhi-Wagner. 2001. O gênero *Eragrostis* (Poaceae) no Brasil. Iheringia, Bot. 55:23–169.

Clayton, W.D. 1974. 56. *Eragrostis*. In: Clayton, W.D., S.M. Phillips, and S.A. Renvoize, Gramineae (part 2), Flora of Tropical East Africa. A.A. Balkema, Rotterdam. Pp. 188–244.

Clayton, W. D. and S. A. Renvoize. 1986. Genera Graminum: Grasses of the World. Her Majesty's Stationary Office, London.

Clifford, H.T. 1996. Etymological Dictionary of Grasses, Version 1.0 (CD-ROM). Expert Center for Taxonomic Identification, Amsterdam, The Netherlands.

Columbus, J.T., R. Cerros-Tlatilpa, M.S. Kinney, M.E. Siqueiros-Delgado, H.L. Bell, and M.P. Griffith. 2005. Molecular phylogenetics of the Chloridoideae (Gramineae). In: J.T. Columbus, E.A. Friar, J.M. Porter, L.M. Prince and M.G. Simpson, eds. Monocots: Comparative biology and evolution, 2 vols. Rancho Santa Ana Botanic Garden, Claremont, In Press.

Cope, T.A. 1998. A synopsis of *Eragrostis* Wolf (Poaceae) in the flora Zambesiaca area. Kew Bull. 53:129–164.

Davidse, G. 1994. 83. *Eragrostis* Wolf. In: G. Davidse, M Sousa S., and A.O. Chater, eds. Flora Mesoamericana Vol. 6 Alismataceae a Cyperaceae. Universidad Nacional Autónoma de México, México D.F., Missouri Botanical Garden, and The Natural History Museum (London). Pp. 263–272.

Dávila-Aranda, P., R. Lira-Saade, and J. Valdés-Reyna. 2004. Endemic species of grasses in Mexico: A phytogeographic approach. Biodivers. & Conservation 13:1101–1121.

Ellis, R.P. 1984. *Eragrostis walteri*–A first record on non-Kranz leaf anatomy in the subfamily Chloridoideae (Poaceae). South Africa J. Bot. 3:380–386.

ESPEJO-SERNA, A., A.R. LÓPEZ-FERRARI, and J. VALDÉS-REYNA. 2000. Poaceae. In: A. Espejo Serna and A.R. López-Ferrari, eds. Las Monocotyledóneas Mexicanas: una synopsis florística, Partes IX–XI. Consejo Nacional de la Flora de México, A.C., Univerisidad Autónoma Metropolitana-Izapalapa, and Comisión Nacional para el conocimiento y uso de la Biodiversidad, México, D.F. Pp. 10:8–236.

FOURNIER, E. 1886. Mexicanas plantas. Pars secunda: Gramineae 2:1–160.

HARVEY, L.H. 1948. *Eragrostis* in North and Middle America. PhD dissertation, University of Michigan, 269 pp.

HILU, K.W. and L.A. ALICE. 2000. Phylogenetic relationships in subfamily Chloridoideae (Poaceae) based on *mat*K sequences. A preliminary assessment. In: S.W.L. Jacobs and J. Everett, eds. Grasses: Systematics and evolution. CSIRO, Melbourne. Pp. 184–188.

HILU, K.W. and L. A. ALICE. 2001. A phylogeny of Chloridoideae (Poaceae) based on *mat*K sequences. Syst. Bot. 26:386–405.

INGRAM, A.L. and J.J. DOYLE. 2003. The origin and evolution of *Eragrostis tef* (Poaceae) and related polyploids: evidence from nuclear *waxy* and plastid *rps*16. Amer. J. Bot. 90:116–122.

INGRAM, A.L. and J.J. DOYLE. 2004. Is *Eragrostis* (Poaceae) monophyletic? Insights from nuclear and plastid sequence data. Syst. Bot. 29:545–552.

INGRAM, A.L. and J.J. DOYLE. 2005. *Eragrostis* (Poaceae): Monophyly and infrageneric classification. In: J.T. Columbus, E.A. Friar, J.M. Porter, L.M. Prince and M.G. Simpson, eds. Monocots: Comparative biology and evolution, 2 vols. Rancho Santa Ana Botanic Garden, Claremont, In Press.

KOCH, S.D. 1974. The *Eragrostis pectinacea-pilosa* complex in North and Central America (Gramineae: Eragrostideae). Illinois Biol. Monogr. 48:1–75.

KOCH, S.D. and I. SÁNCHEZ-VEGA. 1985. *Eragrostis mexicana, E. neomexicana, E. orcuttiana*, and *E. virescens*: the resolution of a taxonomic problem. Phytologia 58:377–381.

LAZARIDES, M. 1997. A revision of *Eragrostis* (Eragrostideae, Eleusininae, Poaceae) in Australia. Austral. Syst. Bot. 10:77–187.

MCVAUGH, R. 1983. Flora Novo-Galiciana. A descriptive account of the vascular plants of western México. Gramineae. 14:1–436. University of Michigan Press, Ann Arbor.

NICORA, E.G. 1998. Revisíon del género *Eragrostis* Wolf (Gramineae-Eragrostideae) para Argentina y países limítrofes. Boissiera 54:8–109.

OGDEN, E.L. 1896. II. Leaf structure of *Jouvea* and of *Eragrostis obtusiflora*. Bull. Torrey Bot. Club. 23:10–20, 22, plate XIII, IX.

PETERSON, P.M. 2001. 7. *Eragrostis* Wolf, pp. 25–55. In: Laegaard, S. and P.M. Peterson, 214(2). Gramineae (part 2) subfam. Chloridoideae. Flora of Ecuador 68:1–131.

PETERSON, P.M. 2003. *Eragrostis*. In: M.E. Barkworth, K. M. Capels, S. Long and M. B. Piep, eds. Magnoliophyta: Commelinidae (in part): Poaceae, part 2. Flora of North America North of Mexico, volume 25. Oxford University Press, New York. Pp. 65–105.

PETERSON, P.M., J.T. COLUMBUS, and S.J. PENNINGTON. 2005. Classification and biogeography of New World grasses: Chloridoideae. In: J.T. Columbus, E.A. Friar, J.M. Porter, L.M. Prince and M.G. Simpson, eds. Monocots: Comparative biology and evolution, 2 vols. Rancho Santa Ana Botanic Garden, Claremont, In Press.

Peterson, P.M., R. J. Soreng, G. Davidse, T. Filguerias, F. O. Zuloaga, and E. Judziewicz. 2001. Catalogue of New world grasses (Poaceae): II. subfamily Chloridoideae. Contr. U.S. Natl. Herb. 41:1–255.

Peterson, P.M., R. D. Webster, and J. Valdés-Reyna. 1995. Subtribal classification of the New World Eragrostideae (Poaceae: Chloridoideae). Sida 16:529–544.

Peterson, P.M., R.D. Webster, and J. Valdés-Reyna. 1997. Genera of the New World Eragrostideae (Poaceae: Chloridoideae). Smithsonian Contr. Bot. 87:1–50.

Prendergast, H.D.V., P.W. Hattersley, N.E. Stone, and M. Lazarides. 1986. C_4 acid decarboxylation type in *Eragrostis* (Poaceae): patterns of variation in chloroplast position, ultrastructure and geographical distribution. Pl. Cell Environm. 9:333–344.

Reeder, J.R. 1986. Another look at *Eragrostis tephrosanthos* (Gramineae). Phytologia 60: 153–154.

Sánchez Vega, I. and S.D. Koch. 1988. Estudio biosistemático de *Eragrostis mexicana*, *E. neomexicana*, *E. orcuttiana*, y *E. virescens* (Gramineae: Chloridoideae). Bol. Soc. Bot. 48: 95–112.

Simon, B.K. 1983. Nomenclatural notes on *Eragrostis cilianensis* (All.) Vign. ex Janchen. Austral. Syst. Bot. Soc. Newslett. 37:6–7.

Van den Borre, A. and L. Watson. 1994. The infrageneric classification of *Eragrostis* (Poaceae). Taxon 43:383–422.

Van den Borre, A. and L. Watson. 1997. On the classification of the Chloridoideae (Poaceae). Austral. Syst. Bot. 10:491–531.

Van den Borre, A. and L. Watson. 2000. On the classification of the Chloridoideae: Results from morphological and leaf anatomical data analyses. In: S.W.L. Jacobs and J. Everett, eds. Grasses: Systematics and evolution. CSIRO, Melbourne. Pp. 180–183.

Watson, L. and M. J. Dallwitz. 1992. The grass genera of the World. C.A.B. International, Wallingford, U.K.

Watson, L. and M.J. Dallwitz. 2003. Grass genera of the World: descriptions, illustrations, identification, and information retrieval; including synonyms, morphology, anatomy, physiology, phytochemistry, cytology, classification, pathogens, World and local distribution, and references. delta-intkey.com.

Witherspoon, J.T. 1975. A numerical taxonomic study of the *Eragrostis intermedia* complex (Poaceae). PhD dissertation, University of Montana, 479 pp.

Wolf, N.M. von. 1776. Genera plantarum vocabulis characteristicis definita. Published by the author, Königsberg.